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The Association does not accept the responsibility for the opinions of contributors. Offensive personalities must be avoided.

LAST CALL FOR THE DENVER CONVENTION.

BY the time this issue is in the hands of its readers, the final preparations of the local committee of arrangements will have been completed, and the stage set for the opening of the Sixtieth Convention, at Denver, August 19.

If any members are still hesitating in regard to attending, they should decide at once, and of course should decide affirmatively. No matter what his position or rank in pharmacy may be, the member who attends will have a better investment for his money than the one who stays at home and puts it in the bank.

You know how much you owe your jobber, and you are punctilious in paying him. How much do you owe yourself, and when do you expect to pay the bill? If you are an average druggist, the debt is a pretty big one and long overdue.

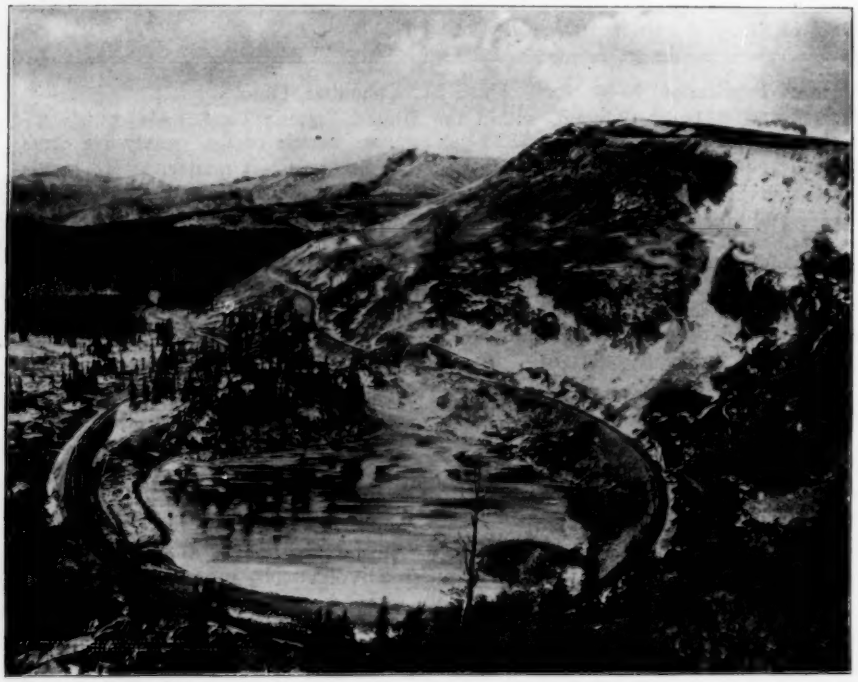
Your daily grind is more exacting and nerve-exhausting than that of the inmates of the state's penal institutions, and your limits of action nearly as confined. What are you getting out of life to compensate you for your self-imposed slavery?

Of course you will take a long rest some day—the undertaker will see to that—but why not take a partial rest now, and postpone the undertaker's intervention? Why not get some of the joy of living while you live? Why not see something of this big country of ours, the thriving cities of the central states, the broad prairies of the middle west, and the new civilization and enterprise of the Rocky Mountain region, the great backbone of the Continent?

Will it pay you in dollars and cents? Ask the men who have attended the

meetings year after year. These are the men who know, and their testimony is all on one side. They are not pharmaceutical misfits, but shrewd business men—regular money farmers in fact—who plant dollars to raise more dollars. Without exception they have found that it pays them to attend the annual meeting—pays not only in renewed physical and mental vigor, but in increased business and larger bank accounts.

The pharmacists of the country are coming to take a larger view of life and business, and of their relations to them. They are beginning to understand that the saving which keeps them from meeting with their fellow pharmacists and from learning what is being done elsewhere, is not economy but rank wastefulness—the wasting of an opportunity to invest money where it would return itself



YANKEE DOODLE LAKE.
More than 10,000 feet above the sea, and 60 miles from Denver.

many-fold. Such economy is rank penuriousness, or expressed in proverbial phrase, penny wisdom and pound foolishness.

The trip means a delightful vacation in very delightful company. It means coming in contact with the brainiest men in pharmacy, who have new and good ideas and know how to tell them, and have been gathering good things for a year for this meeting. It means a visit to some of the most interesting regions of the continent—regions you have always intended to visit some day, or if you have already been there, to visit again.

The man who would go, but is kept at home against his will, is unfortunate; the man who might go but does not, is foolish.

HOTELS AND RATES.

Brown Palace (official headquarters) Seventeenth and Tremont, 350 rooms, $1.50 and up without bath; $2.50 and up with bath. For two persons occupying room, $2.50 and up without bath, and $4.00 and up with bath.

Hotel Savoy, Hotel Shirley, Hotel Metropole, all opposite Brown Palace, and rates same.

Kaiserhof, 125 rooms, $1.00 to $2.50 without bath, $1.50 to $4.00 with bath.

DeSoto, 1848 Broadway, 80 rooms, $1.00 to $3.00.

Adams, Eighteenth and Welton, 150 rooms, $1.00 to $4.00.

Hotel Tremont, Seventeenth and Tremont, 54 rooms, $1.50 to $2.50.

Hotel Toovey, 3 East Twentieth avenue, 6 rooms, 75 cents to $1.00.

DIXIE LAKE.
One mile beyond Yankee Doodle Lake, and 160 feet higher.

All of the above are on the European plan, and within easy walking distance of the official headuarters. Reservations can be made, either direct or through Local Secretary Charles M. Ford, 1236 Ogden street, Denver.

REPORT ON ROUTES AND RATES BY THE TRANSPORTATION COMMITTEE.

All who contemplate attending the Denver meeting of the American Pharmaceutical Association, which convenes on the afternoon of Monday August 19, should purchase regular round trip summer excursion tickets, as no special rate has been made from the East. Members must use the same route east of Buffalo going and coming, but may go by one route and return by another west of that

SNOWBALLS IN AUGUST.
On the top of the world, 60 miles from Denver.

THE SUMMIT OF THE CONTINENTAL DIVIDE.
11,660 feet above sea level, and 64 miles from Denver. Within this distance the train has climbed one mile twelve hundred and ten feet.

point. The routes both ways must be specified when purchasing tickets. Tickets will be good until October 31 and holders may stop over, on due notice, either going or coming.

Tickets may be purchased to Colorado Springs for the same price as to Denver, with stop-over privilege at the latter point.

The members should decide before leaving for Denver whether or not they wsh to take in the Salt Lake or the Yellowstone Park trip, since the tickets for these additional trips will cost less if purchased in the East than if bought at Denver.

The following routes are recommended by the committee: Members should consult the nearest member of the committee regarding local routes and time of departure of trains.

Friday, August 16, leave Boston (B. & A.), at 11:30 a. m., leave Albany (N. Y. C.) 5:15 p. m., leave Philadelphia (Lehigh Valley) 12:30 noon, leave New York (Lehigh Valley) 12:05, noon, leave Buffalo (Grand Trunk) 10:55 p. m.

Saturday, August 17, arrive Chicago (L. S. & M. S.) 12:50 p. m. (Grand Trunk) 2 p. m. Leave Chicago (Chicago, Burlington & Quincy) 5 p. m.

Sunday, August 18, arrive Denver 7:30 p. m. Round trip.

The round trip fare by the routes indicated are given below:

RAILROAD FARE FOR ROUND TRIP TO DENVER.

	To Denver only	Including Salt Lake City	Including Yellow-stone	Lncluding San Francisco
Boston	$70.80	$83.80	$131.80	$113.30
New York	64.30	76.30	131.80	111.80
Baltimore	62.80	75.80	123.55	105.30
Philadelphia	65.55	78.55	126.30	108.05
Chicago	30.00	43.00	98.50	72.50
St. Louis	25.00	38.00	93.50	70.00
San Francisco	55.00	.....	.....	.....

The sleeper fare for the round trip will be $22 from New York, $12 from Chicago, and $11 from St. Louis, with a discount of 20 per cent on upper berths.

For further information members should consult the nearest member of the Transportation Committee, which is as follows:

Atlanta, Ga.—W. S. Elkin, Jr., Peachtree and Marietta Streets.
Baltimore, Md.—Chas. Caspari, Jr., University of Maryland.
Boston, Mass.—C. Herbert Packard, 7 Central Square.
Chicago, Ill.—Wilhelm Bodemann, Hyde Park.
Cincinnati, O.—Charles G. Merrell, Fifth and Butler Streets.
Cleveland, O.—L. C. Hopp, 1104 Euclid Avenue.
Denver, Col.—W. A. Hover, 1437 Lawrence Street.
Minneapolis, Minn.—F. J. Wulling, Minnesota University.
San Francisco, Cal.—Charles W. Whilden, 1727 Pine Street.
St. Louis, Mo.—H. M. Whelpley, 2342 Albion Place.
New York, N. Y.—Caswell A. Mayo, 66 West Broadway, *Chairman.*

ASSOCIATION TEAM WORK.

LIKE the devils of Gadarene nativity, the evils which afflict pharmacy are legion. Sunday work and too many hours of labor on secular days, price cutting and physicians' dispensing, inefficient and insufficient help, fake patent medicines and over-priced proprietaries, cocaine and liquor selling in drug stores, the common indifference of the mass of druggists to association work, educational and legislative problems—these are only a few of the questions with which the pharmaceutical associations must struggle, and as a consequence they have usually been tempted to spread their efforts over too wide a field and to expend their energies upon too great a range of subjects.

This diffusion of energy and consequent loss of effectiveness is true not only as regards the efforts of the individual societies, but is reflected in the failure of the different societies to act in concert with each other.

As far as the writer has been able to observe, the A. Ph. A. and the N. A. R. D. are in substantial agreement upon all the great questions which confront pharmacy, but to date there has been a conspicuous lack of "team work" in their efforts to solve these questions. One year the A. Ph. A. makes a special feature of some particular professional or trade evil, and perhaps deals some effective blows upon it, while the N. A. R. D. belabors with equal lustiness some other evil, but is is generally by accident that they both attack the same problem at the same time.

This lack of coordinated effort between these two great national bodies fairly illustrates the relations of the numerous state and local pharmaceutical societies to each other—they profess to be and, in fact, are in sympathy with each other, but they do not pull together, and consequently fail to realize the full effect of collective effort.

That the various organizations have accomplished a vast amount of good in all the lines of work they have attempted will not be disputed by any candid and unprejudiced observer, but their energies have been so widely diffused in time and space that they have not made the decided impression that would have been made by more concentrated and better directed effort.

In an important sense, perhaps, this general work has not been wasted; it has been a necessary antecedent to the work which is to follow. It has cleared away the tangle of trivialities that obscured the field and has brought the real and vital issues squarely into view; it has developed intelligent sentiment and a common understanding upon a variety of subjects, and has replaced erroneous and hazy ideas by correct and distinct ones. It has been the preliminary skirmishing that has uncovered the nature of the difficulties that must be overcome and has exposed the points upon which the real attacks should be delivered.

It is time now, however, when pharmaceutical organizations should begin to "bunch their hits," and replace their separate efforts by "team work," to stop irregular sniping and try the effect of firing by volleys.

THE JOURNAL suggests that at their respective meetings this month the A. Ph. A. and N. A. R. D. select a list of subjects upon which they will cooperate during the next twelvemonth, and that they invite every state and local organization of pharmacists and every individual pharmacist in the country to help carry this joint program to a successful issue.

J. H. BEAL.

SHORTER HOURS AND SUNDAY REST.

FOR years this question has been the subject of debate and resolution with the A. Ph. A. and N. A. R. D., and probably with the majority of state associations, and except that here and there the pharmacists of some of the smaller communities have adopted better hours, and that a few individual pharmacists have emancipated themselves by independent action, nothing effectual has been accomplished.

The subject is referred to here, not with the object of adding anything to what has already been said upon it, but partly for the purpose of calling attention to an excellent collection of papers upon this topic printed in *N. A. R. D. Notes* of June 20, and partly to suggest that Shorter Hours and Sunday Rest would be a very appropriate subject for concerted action by all pharmaceutical bodies during the coming year—and for as many years afterward as may be necessary to accomplish this greatly needed reform.

With but few exceptions the pharmacists who have expressed themselves upon this topic have declared that drug stores everywhere may be closed, either for the whole or for the larger part of each Sunday, without detriment to the community, and without material loss to their proprietors, and that such small financial loss as may occur is more than compensated by the increased physical well being and mental reinforcement of the proprietor and his assistants.

The men who thus speak are not pharmaceutical derelicts, but men who have been successful in business to an eminent degree, and who speak out of the fullness of experience, and there are no others better able to speak with authority.

Practically all of them are emphatic in asserting that the need of supplying medical articles does not require stores to be open all day on Sunday, and they are equally emphatic in asserting that where such a practice obtains mercenary motives are alone responsible.

In fact the evidence in favor of complete or partial Sunday closing is so voluminous, so pointed and so clear, that no court or jury to which it was submitted would fail to find in favor of it.

Of the plans suggested for Sunday closing two seem to have been most successful where tried:

To close all but one or two stores in a town or neighborhood, the closed stores having in their windows the names of the ones open on that day, the stores to remain open being selected in regular rotation.

To close all of the stores every Sunday, except for two or three hours in the morning and evening.

Both of these plans require concert of action for their successful operation, but some assert that the pharmacist who is brave enough to do so can close his own store either for the whole or part of the day without regard to what others in the same community or neighborhood may do, and instance their own experience as evidence that this independent action may be taken without loss, or that the loss will be more than made up by increased trade on week days.

That the cruelly long hours of the pharmacist are responsible for many other pharmaceutical evils there is not the slightest particle of doubt, and it is morally certain that longer and more frequent periods of rest would result in such a broadening of the pharmacist's outook upon life, and would have such a clarifying

effect upon his understanding as would enable him to better comprehend other proposed reforms and induce him to contribute his efforts for their accomplishment.

J. H. BEAL.

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THE CERTIFICATION OF PHARMACIES.

CLASSIFICATION for the purpose of indicating superiority or excellence has been adopted in a good many callings.

In the eternal struggle for existence it has often come to pass that "caveat emptor" has assumed a meaning far beyond that originally intended by the law. It is often a case of "the buyer had better look out or he is sure to get stung."

While a good many business men and a still greater number of those engaged in professional pursuits have long ago recognized the fact that the buyer is entitled to a great deal of consideration, and that the very fact of his patronage is an expression of confidence which should be guarded as a precious jewel, there will always be men who are ready to sacrifice honor, and even life, for the sake of paltry gain. And while eventually such tactics are bound to result in failure, still the innocent purchaser and the honest seller are of necessity the sufferers under such conditions.

Some things are so familiar to the public at large that a little reasonable care in their selection will enable the purchaser to "beware;" others are of such a character that nothing short of special training will enable one to separate the good from the bad, and it is especially in goods which are of the utmost importance for the maintenance of health and the combating of disease that the latter applies.

Recognizing these conditions the makers of delicate instruments have long ago resorted to special methods of testing, and instruments so tested are "certified," thus giving the purchaser an additional assurance of accuracy. The modern business doctor, the accountant, appeals to his prospective patrons by being "certified." Infant mortality, the cause of which went unrecognized for an almost criminally long time, has been greatly reduced by the knowledge that the infant's staff of life must be pure, and today milk inspection and the "certification" of dairies complying with certain requirements laid down by the milk commission are cutting down death and disease among infants in perceptible amount.

What holds good in other lines of business and in other professions surely may successfully be applied to one of the most important callings of modern civilized life, pharmacy. Even in Galen's time there were complaints of the substituting and irresponsible pharmacist, and the trend of time has not been able to completely eliminate that blot on the pharmaceutical profession, the unreliable druggist. There seems to be no adequate reason then why the pharmacist who carefully and conscientiously follows his professional calling, who is specially equipped, both educationally and with laboratory facilities, should not be distinguished from his less well prepared or less willing brother by having his store certified.

As to the requirements which a store must meet in order to become certified, careful thought should be given to this subject and rules must be laid down which, while not prohibitive, will make reasonably sure of the fitness both of the pharmacist and his pharmacy before certification is granted.

No pharmacy should be admitted to certification which is not owned and act-

ually managed by a duly registered pharmacist. A certain amount of equipment, a fair minimum of paraphernalia, should be found in the store, and this should include also a reasonable reference library. Counter-prescribing should be an absolute disqualifying agent, as well as any attempt at substitution or sophistication in the compounding of physicians' prescriptions. And lastly I would consider any pharmacy unfit for certification which sells liquors in any shape or form for beverage purposes.

The officers charged with the appointing of the committees which are to grant these certificates have a duty to perform which must not be underestimated. The power vested in such a committee, for good or for evil, is far reaching, and only such men should receive an appointment thereon who have no private enterprises to foster; nor should men be appointed whose only claim to recognition is the political power which they hold in their local, state or national association. They should be men who, without fear and without favor, will grant a certification to their bitterest enemy, should he be worthy, and will refuse such certification to their best friend, should he fail to meet the necessary requirements.

There are plenty of men in pharmacy who are fully able to perform this duty, who will give their time and labor without remuneration, for the benefit of humanity and of their calling. Again there are men who will make every effort to receive an appointment on this committee whose own stores could not conscientiously be certified.

A serious duty is thus imposed on the Chairman of the Medical Society of the County of New York and on the Chairman of the New York Branch A. Ph. A. The entire nation will be watching the makeup and the work of this committee. It is the first and greatest opportunity which pharmacy has to prove its fitness to be enrolled as a true profession. Will we utilize this opportunity, or will we again permit the pharmaceutical politicians to barter away our birthright?

J. DINER.

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"DRUGGISTS ARE MEN OF NO GREAT LEARNING."

IN the recent decision in the noted "broken senna" case in the United States District Court for the Southern District of New York, Judge Hand said, among other things: "The Pharmacopoeia is a book put in the hands of druggists all over the country, *men of no great learning,* for practical use," or, putting the statement in affirmative form, that pharmacists as a class are men of very little learning.

Such a statement from a learned Judge of a Federal Court should not be allowed to pass by unanswered.

In our opinion the pharmacists of the United States who take an interest in pharmacy as a profession, and who are members of the American Pharmaceutical Association, *are men of very considerable learning,* and therefore do not deserve this criticism of the Federal Judge. It has often been said, and said truly, that the American Pharmaceutical Association in its annual conventions, in the monthly meetings of the Branches, and in its publications, as the Journal, Proceedings, Committee Reports, National Formulary, etc., provides a real post-graduate course of pharmacy. In order to be a graduate of a college of pharmacy, higher

education is demanded, and in order to pass the State Board examination in most of the states it is practically necessary to be a college graduate.

The writer well remembers that not many years ago the youth in a law office would go to an evening law school, where no "regent's counts" were required, take the state board examination and was then admitted to the bar. And this was the manner in which a great many lawyers who are now judges obtained their education, while thousands of practicing lawyers never saw the inside of a law school of any kind.

We are unable to agree with the learned judge that pharmacists as a class are men of no great learning, and believe that his dictum does a great injustice to a class of men who are equally as well educated as those who practice law, though perhaps not so much given to the parading of their learning in public places.

OTTO RAUBENHEIMER.

SIMPLER PHRASEOLOGY.

It is with rejoicing that one notes the tendency toward simpler language and phraseology in recent scientific literature. It is to be regretted that some of the texts and treatises on medical and surgical subjects show a less noticeable degree of improvement than do scientific periodicals and research publications. Probably there was a time when the use of cumbersome and sonorous phrases lent a sort of dignity to medical literature, particularly in the estimation of the general public. Recently, however, many writers are acting on the theory that no need exists for borrowing dignity from so doubtful a source, and that the simpler the language, the more accurately and readily it will convey the intended meaning. Some medical authors find occasions when "cause" expresses their meaning as well as "etiological factor," and when it is as easy to have the patient "lie down" as to make him "assume a recumbent posture." We welcome the time when any work which defines a fracture as "a traumatic or pathological solution of the continuity of osseous structure," or abounds in verbiage equally atrocious, will be preserved and read only as a curiosity.—*Journal A. M. A.*

Book Reviews

DIGEST OF COMMENTS ON THE PHARMACOPOEIA OF THE UNITED STATES OF AMERICA (Eighth Decennial Revision) AND ON THE NATIONAL FORMULARY (Third Edition) FOR THE CALENDAR YEAR ENDING DECEMBER 31, 1910. By Murray Galt Motter and Martin I. Wilbert. Washington, Government Printing Office, 1912. Hygienic Laboratory, Bulletin No. 84. Public Health and Marine Hospital Service of the United States.

Only a few months have elapsed since Bulletin No. 78, containing the "Digest of Comments" for 1909 has been pubished, a review of which was given in THE JOURNAL A. Ph. A., May, pp. 405-408, from the standpoint of the food and drug chemist, of the teacher and scientist, and of the retail pharmacist.

The present volume, the sixth of the series of "Digests," was published in May, 1912, and on 784 pages contains the comments on U. S. P. VIII and N. F. III, including also the comments immediately preceding and following the U. S. P. Convention in Washington, May 10, 1910. The arrangement of the book is an excellent one, as has already been described in a review of the "Digest" for 1909 on page 407 of the May number of THE JOURNAL A. PH. A. The writer might be permitted to point out that under Nonpharmacopœial Standards the proposed "Recipe Book" of the A. Ph. A. is mentioned in title as well as in three comments on page 113.

In the list of Pharmacopœias and Nonofficial Standards, on page 19, we find that the British Pharmaceutical Codex, London, 1911, is given. Inasmuch as the "Digest" is for the year 1910 and inasmuch as the second edition of the B. P. Cx. was not published until October, 1911, we are of the opinion that the first edition, 1907, is the one which should have been referred to. We also notice that the preface of the "Digest" mentions the second edition of the Greek Pharmacopœia, which work, however, is not mentioned under the "title abbreviations" on page 19. Strictly speaking there is no such work, as the excellent dispensatory or "Pharmakopolia," by Prof. A. K. Dambergis, of Athens, has taken its place and has been made official. The writer, who happened to have the second edition, published in 1910, in his library had occasion to mention this in the symposium on the pharmacopœias of the world, held at the Richmond meeting of the A. Ph. A. (Proc., Vol. 58, p. 1135.)

The compilers of the "Digest," Messrs. Motter and Wilbert, are not responsible for the spelling of the word "sirup" in place of the pharmacopœial title "syrup," the former being given by Webster's International Dictionary, which governs the style of the Government Printing Office. Is this also true of the word "niter," instead of "nitre," in "sweet spirit of niter," which occurs several times on page 723?

It will undoubtedly be of interest to chemists and pharmacists, who are actively engaged in clinical laboratory investigations, to learn that the chapter on

"Clinical tests" occupies 20 pages and deals with urine, faeces, gastric contents, blood, sputum, stains, culture media, biologic methods and Wassermann reaction.

The compilers, as well as the Hygienic Laboratory, are to be complimented on the series of "Digests" which throw so much light on pharmaceutical problems. These publications have become indispensable to teacher and scientist, to analytical and manufacturing chemist, and to wholesale and quite especially to retail pharmacists.

We would therefore advise the members of the A. Ph. A. to procure a copy of Bulletin No. 84 and not only give same a place in their library, but to make frequent use of the book, which is a true digest of comments on pharmaceutical problems during 1910. OTTO RAUBENHEIMER.

VACATION TIME.

More than almost any other class of business men the druggist seems to think that he cannot get away to take a vacation. There is no exception to the rule that all men need a vacation every year and that all will do more and better work fifty weeks in a year than fifty-two. In all probability the average man would do more work if he worked but eleven months a year than he does working twelve. The vacation that is omitted this year may not bring its corresponding reduction in working value at once. It may not result in any diminution of capacity this year, or even next. But it is certain that any engine, human or mechanical, that is run year in and year out without stopping for repairs, will not last anywhere near as long or do anything like the total amount of work that it would do if properly cared for. We believe that there are among our readers not more than a negligible number who would not be better off the first of next January if they were to take two weeks or a month now to recuperate. A man does not waste time when he spends it in a vacation. Beside the value of the change itself, he comes in contact with new forces, with new people and he gets new ideas and new impressions. He goes away with a feeling that his business is a hard uphill fight. He comes back filled with new plans and methods and with the energy to carry them out.—*American Druggist.*

Contributed and Selected

COMPARATIVE ALKALOIDAL STRENGTH OF HYDRASTIS ROOTLETS AND RHIZOME.*

CHARLES H. LA WALL.

Some time ago a client called me up on the telephone and asked which contained the greatest amount of alkaloids, the rhizome or rootlets of hydrastis. I told him that I did not know but would try and find out. I could find neither any reference in literature bearing on the subject nor could I find anybody else who could answer the question among about a dozen chemists whom I consulted.

My client then submitted samples and data which form the basis for this short contribution.

A lot of hydrastis weighing 98 pounds net was seen to consist of such a large proportion of rhizomes that it was deemed advisable to make a complete separation and separate assays for guidance in future purchases. Upon cleaning the drug and separating the rootlets from the rhizomes the following fractions were obtained:

Rhizomes	45 1/2 lbs.
Rootlets	48 lbs.
Dirt and dust	3 5/16 lbs.
Loss in cleaning (unaccounted for)	1 3/16 lbs.
Total	98 lbs.

Of the 93½ pounds of hydrastis 48.66% was rhizomes and 51.34% was rootlets. Upon assaying these separately the rhizomes were found to assay 2.48%, while the rootlets were found to assay only 1.38% of hydrastine. The total assay of the mixed drug in its original condition, from these figures, must have been 1.92%, which is slightly lower than the U. S. P. standard drug.

The answer to the original question, however, is that hydrastis rhizomes are between 1.5 and 2 times as rich in alkaloids as the rootlets.

A NEW AND RELIABLE METHOD FOR THE PRESERVATION OF ERGOT PREPARATIONS.*

PAUL S. PITTENGER AND CHAS. E. VANDERKLEED.

The deterioration of ergot preparations has for several years occupied the attention of various investigators, but until the present no one has succeeded in devising a method by which these preparations can be put on the market in a form

*Read before the Pennsylvania Pharmaceutical Association, June, 1912.

which will remain stable for a considerable length of time. So serious a problem had the deterioration of these products become, that it was deemed advisable that the actual date of test be made to appear on all ergot preparations in order that pharmacists and physicians might be enabled to use their expert judgment as to whether or not any particular product should be employed.

Without question, heat and access of oxygen of the air are the most potent factors in facilitating the deterioration of ergot, but the continued examination of many samples led us to believe the access of air to be the most important cause of deterioration. It has been known for some time that well filled, tightly stoppered containers of fluidextract of ergot will retain their activity for a much longer period of time than containers which are opened from time to time.

Accordingly, on May 2, 1911, the following experiments with fluidextract of ergot were undertaken to determine the value of complete exclusion of air.

A fluidextract was taken which, when intravenously injected in doses of 0.08 cc. per kilo weight gave the following result in changing blood-pressure:

Table No. 1.

	Dog No. 1.			Dog No. 2.		
Injection.	No. 1.	No. 2.	No. 3	No. 4.	No. 5.	Average.
	m.m.	m.m.	m.m.	m.m.	m.m.	m.m
Immediate rise	48	44	28	68	36	48.8
Fall	10	30	46	4	24	22.8
Rise after 5 Min	38	22	30	38	8	25.2
Rise after 10 Min	34	20	18	30	8	22.0
Rise after 15 Min	31	20	14	26	4	19.0

When assayed for total alkaloids by the process of Keller, on May 26, 1911, 0.163% was obtained.

This fluid extract was then divided into four portions which were kept for one year in the laboratory in the following manner:

A—The first portion was put up in vacuum tubes specially designed and made for this purpose.

B—The second portion was filled into bottles which were tightly corked and allowed to remain for one year, unopened.

C—The third portion was filled into bottles which were kept loosely corked for one year, this being obtained by boring a small hole in the cork.

D—The fourth portion was tightly corked but opened occasionally throughout the year.

After three months a test was made of part of the fourth portion (D) which showed a deterioration of 33.3% as shown by Table No. 2.

Injection.	0.08 cc. per kilo.
Immediate rise	30 m.m.
Fall	24 m.m.
Fall after 5 min	—10 m.m.
Fall after 10 min	—13 m.m.

A second test was made of this portion at the end of nine months, when it was found to possess only 44 2/6% of the original activity or to show a deterioration of 55½%, as shown by Table 3:

Injection.	No. 1.	No. 2.	Average.
Immediate rise	20 m.m.	20 m.m.	20 m.m.
Fall	34 m.m.	30 m.m	32 m.m.
Fall after 5 min.	—16 m.m.	—13 m.m.	—14.5 m.m.
Fall after 10 min.	—12 m.m.	—12 m.m.	—12 m.m.
Fall after 15 min.	—8 m.m.	—10 m.m.	—9 m.m.

At the end of a year all four portions were tested with the following results:

Table No. 4.

A—First portion put up in vacuum tubes.

	Dog No. 1			Dog No. 2		Dog No. 3	Dog No. 4	Dog No. 5	Dog No. 6	
Injection	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	Aver.
	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.
Immediate rise	44	52	40	54	52	44	44	58	54	49.1
Fall	7	18	12	30	12	0	0	0	0	8.7
Rise after 5 min.	5	32	20		2	19	0	24	16	13.8
Rise or fall after 10 min.	—2	18		—5	2	4	—3	18	3	4.4
Rise or fall after 15 min.	—2	18		2	1	4	—6	12	—4	3.1

When assayed for total alkaloid by the process of Keller, on May 6, 1912—0.168% was obtained.

Table No. 5.

B—Second portion, tightly corked, unopened.

	Dog No. 1		Dog. No. 2	Dog. No. 3		
Injection	No. 1	No. 2	No. 3	No. 4	No. 5	Average
	m.m.	m.m.	m.m.	m.m.	m.m.	m.m.
Immediate rise	44	28	26	28	23	29.8
Fall	32	22	0	0	6	12.0
Rise after 5 min.	0	2	7	10	2	4.2
Rise after 10 min.	14	0	1.5	4	0	3.9
Rise or fall after 15 min.	14	0	—1.	2.	0	3.0

Table No. 6.

C—Third portion loosely corked.

	Dog No. 1		Dog No. 2		
Injection	No. 1	No. 2	No. 3	No. 4	Average
	m.m.	m.m.	m.m.	m.m.	m.m.
Immediate rise	24	18	6	18	16.5
Fall	38	52	24	24	34.5
Rise or fall after 5 min.	2	—8	—4	—8	—4.5
Rise or fall after 10 min.	3	—4	—3	—4	—2.0
Rise or fall after 15 min.	7	—1	—2	—4	0.0

Table No. 7.

D—Fourth portion, tightly corked, opened occasionally.

Injection	Dog No. 1	Dog No. 2		Average
	No. 1	No. 2	No. 3	
	m.m.	m.m.	m.m.	m.m.
Immediate rise	12.	10.	23.	15.
Fall	54.	40.	26.	40.
Fall after 5 min.	—4.	0.	—18.	—7.3
Fall after 10 min.	—6.	—1.	0	—2.3
Fall after 15 min.	—6.	—2.	0	—2.7

When assayed for total alkaloid by the process of Keller, on May 6, 1912—0.076% was obtained.

SUMMARY.

Table No. 8

How Kept	Date tested	No. of injections	Aver. rise of blood-pressure	Chemical assay for total alkaloid
Original sample	5-26-11	5	44.8 m.m.	0.163%
D—Tightly corked (3 months), opened occasionally	8-24-11	1	30.0 m.m.	
D—Tightly corked (9 months), opened occasionally	2-29-12	2	20.0 m.m.	
A—In *vacuum* (1 year old)	5- 9-12	9	49.1 m.m.	0.168%
B—Tightly corked (1 year old)	5- 9-12	5	29.8 m.m	
C—Loosely corked (1 year old)	5- 9-12	4	16.5 m.m.	
D—Tightly corked (1 year old), opened occasionally	5- 9-12	3	15.0 m.m.	0.076%

The apparent extreme variations in the rises recorded in the different animals are due to both the difference in the susceptibility of the dogs and to the difference in the order of injection of samples. In order to obtain the true relative strengths of the preparations the order of injection was reversed in succeeding animals until each preparation had been given to each of several dogs and the results based on the analysis of the several injections.

It may thus be seen that by adopting the *vacuum* method of putting up ergot the rate of deterioration can be so retarded as to make this product one of stable quality for a considerable length of time.

We have already taken steps to apply the same method of preservation to the preparation of other drugs somewhat prone to deterioration, such as digitalis and strophanthus.

PHYSIOLOGICAL LABORATORY OF H. K. MULFORD COMPANY.

THE REVISION OF THE UNITED STATES PHARMACOPOEIA.*

JOSEPH P. REMINGTON, CHAIRMAN.

The work of preparing the Ninth Revision is proceeding rapidly. The new plan, which differs essentially from all previous methods, while involving more

*Read before the Section on Pharmacology and Therapeutics of the American Medical Association.

labor and consuming more time than any other revision, has justified the wisdom of the convention in adopting the present method, which consists mainly in increasing the number of the members of the General Committee of Revision from twenty-six to fifty, but more especially in creating an Executive Committee of fifteen from this number to prepare a complete report which will finally be approved by the General Committee. Inasmuch as almost the whole work is conducted by correspondence, the voting on the reports which consumes the greatest amount of time is now limited to fifteen members instead of fifty. Each of the members of the General Committee of Revision occupies a place on one or more of the sub-committees, he being given his choice of the particular part of the work which he prefers, the actual appointment, however, having been made by the Chairman of the General Committee, who has charge of the immediate revision of the work.

The plan does not differ from the usual method of doing constructive work in which much detail is involved. A large body, interested in drugs, medicines and preparations, is organized, representing all parts of the country. From this body is first elected a convention, which meets once in ten years; this convention, consisting of about four hundred representatives, elects a committee of fifty, termed the General Committee of Revision; they elect a smaller body of fifteen, called the Executive Committee. The Executive Committee, having fifteen subjects, embracing all of the Pharmacopoeia work, is composed of the chairmen of fifteen sub-committees. The sub-committees work under their chairmen upon the subjects for which they are best fitted. By this plan it is hoped that every valuable suggestion in the work of Revision will find its way from an individual member first to the sub-committee having the subject in charge, then through the Executive Committee, through its report, then to the General Committee, Editor and General Chairman, before it reaches the printer. Considerable time had to be spent effecting a complete organization and at this time the most difficult part of the work is under way.

The following table shows the state of the work in detail:

SUB-COMMITTEE BULLETINS.	Pages
No. 1—Scope	288
No. 2—Therapeutics, etc.	103
No. 3—Biological Products, etc.	80
No. 4—Botany and Pharmacognosy	212
No. 5—Inorganic Chemistry	408
No. 6—Organic Chemistry	659
No. 7—Proximate Assays	202
No. 8—Volatile Oils	34
No. 9—Fluid and Solid Extracts	202
No. 10—Waters and Spirits	139
No. 11—Syrups and Elixirs	258
No. 12—Cerates and Ointments	41
No. 13—Miscellaneous Galenicals	121
No. 14—Tables, Weights, and Measures	75
General Committee Circulars	...
No. 15—Nomenclature	1119
Executive Committee Letters	588
Total	4529

The text has been reported in full to the Executive Committee for 288 articles.

The pages of official circulars, letters and bulletins are given. The circular page is 9 x 16 inches and the official letters and bulletins 8½ x 11 nches. Each circular and letter is numbered and paged consecutively and temporary binders are furnished to each member, these, in turn, being transferred to permanent binders, to be placed upon a book-shelf when 500 pages are completed, constituting Volumes I, II and III, etc. This is necessary because constant reference to preceding pages is required for study. The large pages are used for communications for the General Committee of Revision and are termed Circulars. The smaller pages are used for Executive Committee work, being numbered and paged consecutively, and are termed Letters. The term "Bulletin" is used to designate the letters which pass between the sub-committee members for official comment and record. Communications from firms, corporations, physicians, pharmacists, scientific bodies and the public generally and the replies thereto are not included in the summary, although they constitute a large amount of correspondence.

Naturally, it has consumed considerable time to effect a system for controlling the detail, but when once established, the routine is easily followed. It may be of interest to the American Medical Association to have some detailed information as to the immediate progress of the work.

Sub-committee No. 1, *on the Scope of the Pharmacopoeia,* has practically finished its labors. The sub-committee consists of nine (six physicians, one manufacturing pharmacist, one importer of drugs and one medical doctor, who is a pharmacognocist). It was the duty of the sub-committee to propose the list of Admissions and Deletions, for, while the other members of sub-committtees could employ their time in arranging general subjects pertaining to the classes of preparations of which they have charge, it was necessary to hold up detailed work on these until each sub-committee knew what drugs and preparations they had to work on. Delay was obviated through requesting the sub-committee on Scope to send a report including such well-known and largely used subjects as quinine, opium, rhubarb, digitalis, belladonna, etc., which were approved by every one on the Sub-committee on Scope as admissions. This enabled the sub-committees to begin work at once. Subsequently the Sub-committee on Scope presented a tentative report embracing the full list, as far as possible of articles recommended for admission and deletion. The list, after being approved, was sent for publication to the journals last August. This does not mean that before the book is printed some changes may not be made in the list. A few manifest discrepancies, not exceeding ten, were noticed in this tentative list, but they were corrected at once.

Sub-committee No. 2 *(Therapeutics and Pharmacodynamics)* has been actively engaged in preparing a list of doses, and a posological table has been submitted, which will soon be ready to report to the Executive Committee. The sub-committee has further contributed valuable information on other subjects.

Sub-committee No. 3 *(Biological Products, Diagnostical Tests, etc.).* This subcommittee has taken up animal substances, and a number of experiments have been made to determine reliable data, and the report will soon be ready for the Executive Committee.

Sub-committee No. 4 *(Botany and Pharmacongnosy).* Progress is being made in this sub-committee and a great deal of careful scientific work will come within their domain. The number of workers in the botany and pharmacognosy of medicinal drugs is limited and there are many problems, particularly concerning the origin and identity of plants, that remain unsolved.

The new Pharmacopoeia can not possibly be delayed until every question is settled, but time is required to present the most reliable information to be had. A pharmacopoeia can do no more than present the most reliable and accurate information obtainable. Fortunately ,the drugs of doubtful origin or identity constitute the minority. A great deal of correspondence has passed between the members of this sub-committee.

Sub-committee No. 5 *(General and Inorganic Chemistry).* The sub-committee has accomplished much work. It has one of the largest subjects in the Revision. The first report to the Executive Committee will be completed in a few weeks. A uniform method of taking physical constants, particularly solubilities, has not yet been adopted. These will be inserted after the factors have been determined by actual experiment.

Sub-committee No. 6 *(Organic Chemistry).* The work of this sub-committee is in a forward state. The condition which exists here is the same as of the previous sub-committee. The Executive Committee is in possession of the bulk of the report without the insertion of the physical constants.

Sub-committee No. 7 *(Proximate Assays).* The report of this sub-committee will soon be sent to the Executive Committee. Inasmuch as this work has no interdependence on other sub-committee work, it was deemed best to wait until the report was completed before submitting it to the Execuive Committee. It is nearly finished.

Sub-committee No. 8 *(Volatile Oils).* The chairman of this sub-committee has submitted a tentative report on volatile oils to the sub-committee and it is now being considered. The finished report is expected to soon be laid before the Executive Committee.

Sub-committee No. 9 *(Fluid and Solid Extracts and Tinctures).* A great deal of work has been done on this subject and much has been written in the journals. Evidence is being sifted and, if required, a report could be sent at once upon the greater number of preparations. A few require further tests before adoption. Type samples for the 1880, 1890 and 1900 Pharmacopoeias are in the possession of the Chairman to determine the keeping qualities of fluidextracts and tinctures.

Sub-committee No. 11 *(Syrups and Elixirs), No.* 12 *(Cerates and Ointments), No.* 13*(Miscellaneous Galenicals).* With a few exceptions, reports can be made upon these subjects within two months.

Sub-committee No. 14 *(Tables, Weights and Measures).* A number of tables are ready for report; the standard temperature for use in determining solubilities, specific gravities, etc., have been taken up by the sub-committee, and the chairman has labored indefatigably, but the work requires continual calculation and study; but there is no likelihood that the Executive Committee will be embarrassed on its account when the time comes to need it, because of needless delay.

Sub-committee No. 15 *(Nomenclature).* This sub-committee has sent a preliminary report to the Executive Committee. When the principles of nomenclature

have been settled, the work will not be likely to cause much discussion as far as the Chairman is able to judge. The convention settled the question, very largely, of the nomenclature of the new Pharmacopoeia. The recommendation was as follows:

"We recommend that changes in the titles of articles at present official be made only for the purpose of insuring greater accuracy, brevity, or safety in dispensing, and to eliminate therapeutically suggestive titles. In the case of newly admitted articles, it is recommended that such titles be chosen as are in harmony with general usage and convenient for prescribing, but in the case of chemicals of a definite composition the scientific name should be given at least as a synonym.

"There should also be inserted, after each article used by physicians in prescriptions, a carefully considered, abbreviated name, which may be known as an official abbreviation, in order that uniformity may be established throughout the country, with the object of preventing mistakes in reading and compounding prescriptions, and further, to serve as authorized abbreviations in labeling the store furniture of the pharmacist."

This sub-committee has always reported in previous revisions after the other sub-committees have sent their reports and the admissions and deletions have been finally determined.

It is not surprising in Pharmacopoeia work to hear criticisms in certain quarters asking definite information and date for the appearance of the new book. While every effort should be made persistently and continuously to push the work, great patience is required in order that hasty conclusions or incorrect guesses be eliminated. At present, thousands of interested observers throughout the country where there were hundreds before will scrutinize the pages with the utmost care and with very good reason, for the Food and Drugs Act decisions are based upon the standards of the United States Pharmacopoeia, and it is only by continual vigilance that errors may be eliminated and that a work involving so much responsibility can be successfully produced.

Now is the time to send the Chairman suggestions, criticisms and comments in order that they may be thoroughly considered.

COOPERATIVE WORK ON A UNIFORM METHOD FOR ALCOHOL DETERMINATIONS.*

L. HENRY BERNEGAU.

At one of our last meetings in 1910 a discussion arose in regard to determining the percentage of alcohol in products and preparations such as Wines, Elixirs, Fluidextracts, etc. At this meeting I stated that the percentage of alcohol determined in a certain N. F. preparation by different chemists varied about 3 per cent. The samples of said preparation were assayed for alcohol by three

*Report of Committee of the Scientific Section of the Philadelphia Branch of the American Pharmaceutical Association.

chemists of commercial laboratories, outside of Philadelphia, all of them being known to be highly efficient and reliable.

At the meeting mentioned above it was suggested that samples of a wine and an elixir be submitted to all Philadelphia chemists who were willing to cooperate with us in work on this very important subject. We furnished the samples, which consisted of a wine and an elixir, the latter being made up by myself, and containing only alcohol, water, sugar and caramel. On sending the samples to our chairman, W. A. Pearson, it was stated that the light colored sample was a natural wine, while the darker colored sample was an elixir, containing no highly volatile substances such as ether, chloroform, volatile oils, acids, etc. W. A. Pearson kindly distributed the samples among the Philadelphia chemists who expressed their willingness to cooperate. To each and all of them I would extend my heartiest thanks for their work and interest shown in this subject. Following are the names of the ten gentlemen who received the samples and reported their results:

1. M. Becker, with Smith, Kline & French.
2. C. S. Brinton, Food and Drug Inspection Laboratory, Philadelphia.
3. Geo. E'We, with H. K. Mulford Co.
4. L. Criesmer, a second-year-student at P. C. P., through Prof. LaWall.
5. W. Hilts, of U. S. Food and Drug Inspection Laboratory, Philadelphia.
16. Professor C. H. LaWall.
7. H. B. Mead, Laboratory of Prof. LaWall.
8. C. Roberts, of U. S. Custom House, Philadelphia.
9. H. M. Sechler, with Smith, Kline & French.
16. Otto Stockinger, with H. K. Mulford Co.

The alcohol in the distillate was determined by the different chemists either by means of the pycnometer or by the Westphal balance. The use of the pycnometer is, without doubt, preferable in very accurate scientific work; nevertheless the Westphal balance gives good results if properly handled, and provided the balance is very sensitive to the fourth decimal and standing on a perfectly level plane. Some of the chemists brought the temperature up or down to 15.6° C. before taking the weight or specific gravity, while the others made no corrections in regard to the temperature. Although the temperature has to be taken into account in determinations by any method, it is not necessary for determinations by the Westphal balance to bring the distillate to 15.6° C. It is only necessary to take the specific gravity at the same temperature at which the sample was originally measured. Then by use of the temperature corrections in the alcohol tables, sufficiently accurate results can be obtained. We certainly would obtain bad results if the respective preparations were measured for distillation at about 10° C. and the distillate measured at 35° C. or so. Some of the chemists used calcium carbonate, some sodium bicarbonate, and still others potassium hydroxide for neutralizing the free acids. In some cases the reports did not specify what had been used, or if anything had been used for neutralization.

The results found by the different operators were quite concordant, there being only a difference between extremes of 1.06 per cent. in the wine and 0.78

per cent. in the elixir. If the same method had been used by all, I am sure that much closer results would have been obtained.

The following results were obtained: (I give the names in alphabetical order).

WINE (the light-colored liquid)—

1—M. Becker		17.3%
2—C. S. Brinton,	17.71%—17.73%, average	17.72%
3—Geo. E'We,	18.22%—18.4%, average	18.30%
4—L. Griesmer,	18.36%	18.36%
5—W. Hilts,	17.66%—17.68%, average	17.67%
6—Prof. LaWall,	18.28%—18.12%, average	18.20%
7—H. B. Meade		17.99%
8—C. Roberts		17.39%
9—H. M. Sechler		17.50%
10—O. Stockinger,	17.65%—17.4%, average	17.525%

Mr. O. Stockinger made three determinations of this same wine previous to the sample submitted by W. A. Pearson, and found:

1st—by plain distillation	17.6%
2d—after neutralizing with KOH	17.8%
3d—with an excess of KOH	17.5%
Average	17.63%

ELIXIR (the dark-colored liquid)—

1—M. Becker		25.00%
2—C. S. Brinton,	25.54%—25.55%, average	25.55%
3—Geo. E'We,	25.3% —25.91%, average	25.635%
4—L. Greismer		25.57%
5—W. Hilts,	25.55%—25.55%, average	25.55%
6—Prof. LaWall,	25.83%—25.7%, average	25.765%
7—H. B. Meade		25.35%
8—C. Roberts		25.35%
9—H. M. Sechler		25.54%
10—O. Stockinger,	25.4% —25.4%, average	25.4%

In calculating the alcohol percentage from specific gravity by means of the pycnometer or Westphal balance the following tables were used:

Messrs. Brinton and Hilts used U. S. P. table and also table given in Government Bulletin No. 107 of the Bureau of Chemistry.

Messrs. E'We and Stockinger used U. S. P. table.

Prof. LaWall used U. S. P. table and also table according to Hehner, given in "Leach's Food Inspection and Analysis."

Messrs. Becker, Griesmer, Meade, Roberts and Sechler did not specify which table they used. Most probably the U. S. P. table, as otherwise they would have made some remarks in their reports about it. The difference in these three tables can be called negligible in this case, i. e., in determining the alcohol percentage in wines, elixirs, fluidextracts, etc. The specific gravity by all of the cooperators was taken at 15.6° C. or 60° F., so that no temperature corrections were necessary except by Messrs. E'We, Griesmer and Stockinger, who took the specific gravity at room temperature and made corrections by U. S. P. table. On using the Westphal balance, I personally prefer to bring the distillate to room temperature, taking the temperature exactly during weighing and making corrections afterwards according to U. S. P. table. I would now ask the following questions:

1. What method is preferable in determining the alcohol percentage in this

class of products and preparations (wines, elixirs, etc.), the pycnometer or Westphal balance? I ask the question from the standpoint of a large manufacturing house which sometimes has to make as high as thirty alcohol determinations per day.

2. If the Westphal balance is used, is it preferable to weigh or to take the specific gravity at 15.6° C., or to make temperature corrections according to U. S. P. table?

3. Which of the three tables mentioned is the most nearly correct and which should be adopted for standard: (1) U. S. P., (2) Bulletin No. 107, (3) Leach-Hehner?

4. Which chemical is best suited to neutralize acids with—potassium or sodium hydroxide, calcium carbonate, sodium bicarbonate, etc.?

These four questions refer to the reports of the cooperators' work. In addition, I would ask:

1. Which chemical is best suited to neutralize ammonia—sulphuric acid, phosphoric acid, etc.?

2. What is the best to prevent frothing?

3. What is the best to prevent bumping?

In our work to prevent bumping we use small pieces of unglazed or porous porcelain. To prevent frothing we use with advantage potassium bisulphate, in preparations which contain no acids which, by coming into contact with the acid salt would evolve volatile acids. A layer of melted paraffin is also of value in all cases.

The two samples tested by the cooperators and on which much concordant results were obtained were very simple in regard to their composition. I would greatly appreciate it if the chairman would request the further cooperation of those who assisted with this work, on more difficult problems; that is, on preparations of a more complex nature. I take the liberty of making some suggestions and comments:

A certain class of tinctures, fluidextracts, etc., seem to have an attraction for alcohol and show their unwillingness to part from it by foaming, frothing, bumping, "racketing," etc. Below are given a few of these:

Wild Yam	Senna	Trillium
Quillaja	Asafetida	Buchu
Burdock	Sarsaparilla	Cubeb

From these I would ask that you take your choice for the next series of cooperative tests on alcohol determinations. Some preparations need a double distillation, such as Elixir and Tincture of Ammonia, Aromatic, etc., first by means of sulphuric acid, and second, by means of potassium hydroxide. Preparations containing free iodine should be distilled with sodium thiosulphate and a little potassium hydroxide.

Spirit of camphor, etc., must first be freed from the camphor by the well-known sodium chloride method, before distillation. The addition of calcium hydroxide is of advantage in the distillation of Buchu and Valerian prepara-

tions. Not only will a perfectly clear distillate be obtained, but the bumping will also be considerably diminished.

On distilling unknown preparations with alkalies, tannin should always be used to precipitate any volatile alkaloids.

On closing my report, I would extend my thanks to Mr. Otto Stockinger and Mr. Geo. E'We for their valuable help and suggestions.

SUMMARY.

Chemist	Wine	Elixir	Pycno-meter	Westphal	Plain %	Neutral %		Alkaline %		Average %
M. Becker	—		—		—					17.3
"		—	—		—					25.0
C. S. Brinton.....	—		—			$CaCO_3$	17.71			
"		—	—			$CaCO_3$	17.73			17.72
						$CaCO_3$	25.54			
						$CaCO_3$	25.56			25.55
G. E'We	—	—	—	—	18.4			KOH	18.22	18.31
"		—		—	25.3			KOH	25.91	25.635
L. Griesmer	—		?	?	—					18.36
"		—	?	?	—					25.57
M. Hilts	—		—			$CaCO_3$	17.66			
"		—	—			$CaCO_3$	17.68			17.67
						$CaCO_3$	25.55			
						$CaCO_3$	25.55			25.55
								$NaHCO_3$ & Tannin	18.28	
Prof. LaWall	—		?	?				$NaHCO_3$ & Tannin	18.12	18.20
"		—	?	?				$NaHCO_3$ & Tannin	25.83	
								$NaHCO_3$ & Tannin	25.70	25.765
H. B. Meade	—		?	?						
"		—	?	?				$NaHCO_3$ & Tannin	17.90	17.99
								$NaHCO_3$ & Tannin	25.78	25.78
C. Roberts	—			—	—			$NaHCO_3$ & Tannin		17.39
"		—		—	—			$NaHCO_3$ & Tannin		25.35
H. M. Sechler.....	—		—		—			$NaHCO_3$ & Tannin		17.50
"		—	—		—			$NaHCO_3$ & Tannin		25.54
O. Stockinger	—			—	—			KOH	17.65 / 17.4	17.525
"	—			—	17.6			KOH	15.5	17.63
"		—		—	—			KOH	25.4 / 25.4	25.4

ANALYTIC LABORATORIES, H. K. MULFORD, Co., March 12, 1911.

APPARATUS FOR THE DISTILLATION OF ALCOHOL IN PHARMACEUTICAL PREPARATIONS.

M. BECKER.

In order to overcome the principal physical differences encountered in the estimation of alcohol in preparations the apparatus shown in the accompanying illustration was devised. By its use the need for redistillation due to frothing and bumping is eliminated, consequently saving considerable time and labor.

NOTE.—Since Mr. H. L. Bernegau presented his contribution, no systematic co-operative work has been made by the committee, but Mr. M. Becker, in the Analytic Laboratory of Smith, Kline and French Co., has designed a suitable apparatus for the distillation of most pharmaceutical preparations.

It consists of an elliptical bulb (a) three inches in height, and two and a half inches in width, having a neck (b) three-fourths of an inch long, the opening of which is three-fourths of an inch. The lower end of the bulb (a) terminates with a gradually tapering stem (c) two inches long. The opening at juncture of bulb and stem is three-fourths of an inch and the opening at end of the stem is a quarter of an inch. The interior of the bulb contains a small curved tube (d) blown in at the bottom and extending one and three-quarters of an inch upward and curved so as to almost reach the side. At the base of bulb, slightly lower, and directly under the curved tube (d) is a small opening (e) to permit the

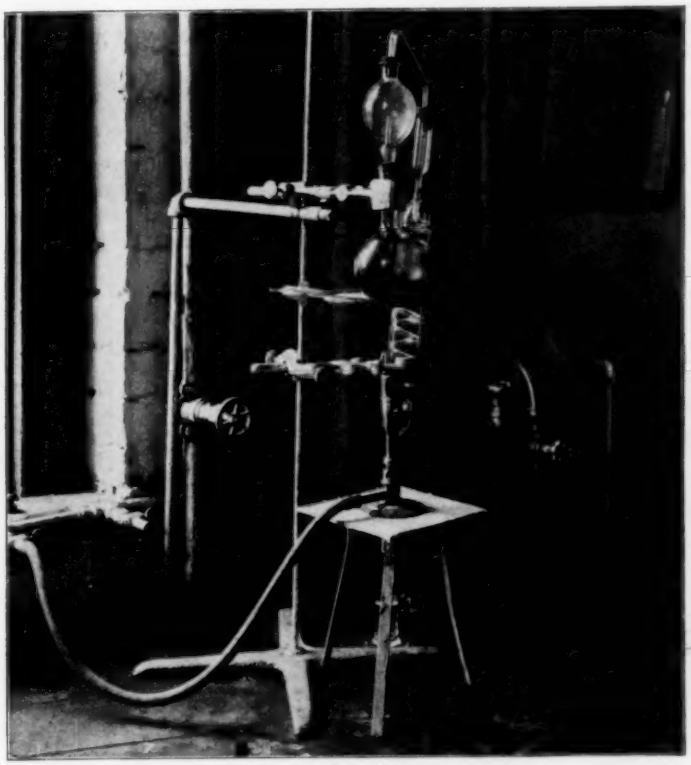

FIG. 1.—From Photograph.

passing of the condensed liquid back into the distilling flask. The stem (c) enables the apparatus to be fitted to an ordinary distilling flask. The neck of bulb was made short in order to more easily admit the tube (g) which is beveled at the end at an angle of 50 degrees and curved in an opposite direction to tube (d) below. This tube (g) is connected to the vertical condenser and can easily be made by the operator. For economy and convenience in cleaning this piece was made separately. It will be noticed that the opening (e) is directly under the curved tube (d) which prevents foam or liquid caused by any active bumping that may occur from passing over into the distillate. The curve in the tube (g)

having the beveled end is intended for a similar purpose, but it is not absolutely necessary.

If during a distillation there is such an active boiling and foaming that the distilling flask and part of the bulb are filled with foam, the curved tube (d) permits the passing of vapor from the flask, and relieves the pressure by allowing substances in bulb to return to the distilling flask through opening (e). In some cases the foam rises to the center of the bulb, but it is not carried over, and soon runs back into the distilling flask.

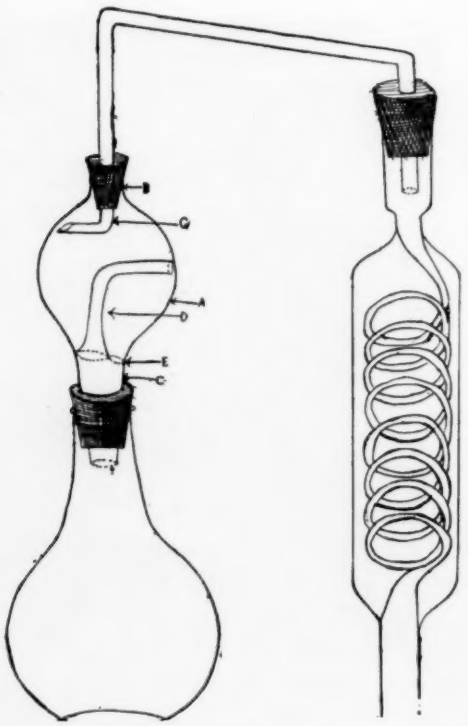

FIG. 2.—Showing Details of Distilling Bulb.

We have given this apparatus the most rigid tests and have never had occasion to make a second distillation. Under ordinary conditions considerable time is required for some fluidextracts, but with this apparatus we have never found it necessary to reduce the flame when estimating the alcohol in such difficult fluidextracts as Rose, Sarsaparilla, Jumbul, Gilead Buds, Soap Bark, Grindelia, White Oak Bark, Kava Kava.

Those interested in making alcohol determinations, where interference by bumping or frothing occurs, will find a great convenience in the use of this apparatus, and will be spared the necessity of redistillation.

PYCNOMETER FOR THE DETERMINATION OF THE SPECIFIC GRAVITY OF ALCOHOLIC DISTILLATES.

C. S. BRINTON.

For several years we have been using with much satisfaction Reischauer's form of Specific Gravity bottle. This consists essentially of a narrow-necked graduated flask of about the same shape as an ordinary graduated flask used in volumetric work. Those, which we first used, were made for us on our own specifications by a commercial glassblower, but were not graduated by him. We specified that the necks of the flasks should not be over 6 mm. in diameter inside, that the flask be as light as possible without sacrificing strength, and that the

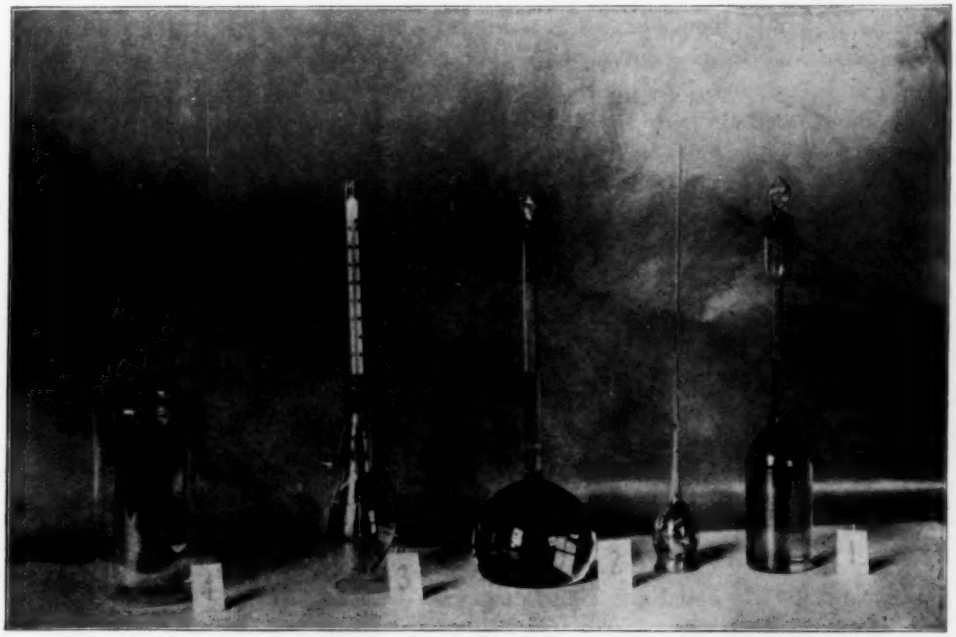

FIG. 3.

mark on the neck should be as low as possible. The empty (100 cc.) flasks, with stoppers, weighed 18 to 20 grams. The tare was obtained, then exactly 100 grams of water weighed into them at room temperature, the flask and water put into a constant temperature at 15.6° C., and allowed to remain there until constant temperature is attained (about 30 minutes is ample time), the position of meniscus is then carefully noted and etched around neck. The tare is then again obtained on the clean dry flask and it is ready for use.

To obtain the specific gravity of any solution, the flask is filled above the mark —care being taken to get rid of air bubbles—and brought to constant temperature at 15.6°, the excess of solution above mark removed by a capillary pipette, neck dried by a strip of filter paper, bottle stoppered, wiped dry and allowed to

warm to room temperature, and weighed. With the 100 gram size it is not necessary to weigh closer than 1 milligram. Subtract the tare, and the specific gravity is obtained at once to five figures without calculation. When only small quantities are available, these flasks can be obtained to hold only 25 or 50 grams, but the necks are smaller and more care is required in filling. For complete directions on the use of this form of pycnometer see "Der Wein und seine Chemie," by Paul Arauner, p. 25-31.

In determining alcohol in any product, a wine for example, the specific gravity bottle is filled as above indicated, then contents transferred to an appropriate distilling flask, the specific gravity bottle rinsed out, and the rinsings added to the main portion. A small quantity of calcium carbonate is added to neutralize any acidity, a piece of porcelain (broken crucible cover) to prevent bumping, and water added to make a total volume about 50 per cent. greater than sample taken, and the liquid is then distilled, catching the distillate in the specific gravity bottle. Distillation is continued until the liquid is almost up to mark, then bottle and contents put in constant temperature bath at 15.6° as before. After about one-half hour the flask is filled exactly to mark with distilled water at 15.6, neck wiped out, etc., as before, and weighed, and tare being subtracted, gives the specific gravity direct when using 100-gram bottle.

These bottles when stoppered do not change in weight, except on long standing, such as overnight, and by following the method given above very accurate results can be obtained. The weights of contents on 100 gram bottles can be checked easily by different operators to less than 5 milligrams, which means a variation of only about 0.05 alcohol at the most, and the agreement is often closer than this amount. Agreement as close as this is not obtainable by the use of ordinary forms of apparatus. Flasks No. 1 and No. 2 in the attached photograph show two forms of this apparatus, form No. 2 being most satisfactory, if mark is low on neck in order to allow for expansion, as it is more stable than form No. 1. The long slender funnel tube is used to fill both forms of bottles.

Reischauer's bottles as shown in photograph form No. 1 in 25, 50 and 100-grams capacity, are listed and kept in stock by Eimer & Amend, New York City.

DEWAR VESSELS AS APPLIED TO THE DETERMINATION OF SPECIFIC GRAVITY OF LIQUIDS.

GEORGE H. MEEKER, PH. D., LL. D.

The now familiar principle of the Dewar flask, originally designed by Professor Dewar for the heat insulation of liquid air, and at present so extensively used for maintaining liquids at constant temperature, is most advantageously employed in maintaining liquids at constant temperature during specific gravity determinations. Two types of such apparatus are here described: one type to be employed by the method of the hydrostatic balance, and the other as a pycnometer.

Hydrostatic Balance Type of Dewar Vessels This type is shown in the accompanying etching as No. 4. It consists of a double walled glass cylinder having a

vacuous space between the walls. It is designed to be employed on the specific gravity bench of the usual analytic balance. Dimensions in millimeters are as follows: height, 100; external diameter, 53; internal diameter, 33; internal depth, 90. The weight when empty is 85 grams and the capacity of the internal chamber is 75 cc. These dimensions may, of course, be somewhat varied. In addition to the cylinder just described, one needs a suitable plummet and suspensory wire. My own practice is to use a small pear-shaped lump of glass, having a hooked apex, as the plummet. This plummet is conveniently made in the blast lamp flame by the analyst himself from a piece of heavy glass rod. For sustaining the plummet I employ fine phosphor-bronze wire, except where special circumstances demand the use of platinum wire. The use of phosphor-bronze is dictated by the fact that it is easy to procure very fine, thoroughly annealed wire of this character, say nothing exceeding .14 mm. diameter. The cost is negligible, and one spool will last indefinitely. I have not found other cheap wires so readily obtainable of suitable fineness, well annealed and so reasonably resistant to chemical action. When platinum wire must be employed I use a wire not exceeding .05 mm. in diameter.

In making a specific gravity determination, a suitable length of the wire is prepared by twisting a loop at each end—one of the loops being intended to hang upon the hook of the balance, and the other being intended for the suspension of the plummet by its hook. Two such wires are prepared—substantially exact duplicates of each other. The analyst, having ascertained the depth to which the lower end of the suspensory wire is to dip beneath the surface of the liquid, cuts off that much of one of the two prepared suspensory wires and then weighs the two parts separately—so as to ascertain what fraction of the weight of the other wire will be immersed in the liquid during the actual specific gravity determination—the pieces being then discarded. The other or actual, suspensory wire and the plummet are now weighed separately, and to the weight of the plummet is added that fraction of the weight of the suspensory wire which is immersed. We will call this combined weight of the plummet and the immersed portion of wire the *weight of the plummet*. The liquid is now brought into the Dewar cylinder at a definite temperature. This is accomplished by immersing a thermometer in the liquid contained in another vessel, bringing the liquid by usual methods of manipulation to the desired temperature and then pouring it backward and forward from the auxiliary vessel to the Dewar cylinder, etc., a sufficient number of times to bring the inner glass walls of the cylinder to the same temperature as the liquid—after which the cylinder is filled to a suitable depth and the liquid will now maintain this temperature practically unchanged throughout the experiment. There is, of course, some opportunity for change of temperature at the surface of the liquid by its contact with the air; but even this local alteration may be made negligible during the time of the experiment by the use of a perforated cover. The weight of the plummet whilst suspended in the liquid is now determined and the usual calculation made: that is to say, from the weight of the plummet in air is subtracted the weight of the plummet in the liquid, and this difference in weight is divided by the difference similarly obtained when the observation is made upon pure distilled water. Of course, temperature plays a

part; and in alcohol determinations the observations should be made at such temperatures as may eventually be officially directed. In making weighings with the plummet immersed, equilibrium must be established with the needle of the balance stationary at zero and the wire immersed to the predetermined depth.

It is believed that the method just described is the most accurate method which could be recommended in the premises. It requires no special apparatus except the special Dewar cylinder.*

The Pycnometer Type of Dewar Vessel: This type is shown in the accompanying etching as No. 3. The pycnometer is best made from Jena thermometer glass, because in this case its capacity at stated temperatue once determined, remains fixed—which is not the case when ordinary glass is employed. The apparatus consists of a double-walled glass flask having a vacuous space between the walls and having an accurately ground glass stopper which is one piece with an inserted thermometer graduated from minus 4° to plus 35° C. by 1/5°. Capacity of inner vessel with stopper inserted, 25 cc. Total weight of apparatus empty, 40 grams. Dimensions in millimeters are: total height over all with thermometer inserted, 210; total height of flask, 100; greatest diameter, 44. In ordering such an apparatus care should be made to specify very accurate grinding of the stopper and the absence of any annular channel exteriorly between the stopper and the neck of the flask. Unless this specification is made the maker is apt to be a little careless and to leave an annular space which is somewhat troublesome to wipe dry before weighing.†

The advantage which the apparatus under discussion has over the usual pycnometer arises from the fact that temperature alterations of the investigated liquid, which are the bane of ordinary pycnometer measurements, are here eliminated because of the thermal insulating property of the vacuous envelope.

The apparatus is used like an ordinary pycnometer, but it is probably desirable to state that the liquid is brought to the specified temperature exactly as in the case of the hydrostatic balance method described above.

*This has been furnished from Germany to the Medico-Chirurgical College of Philadelphia at 56c. duty-free. It may further be interesting to note that the writer uses this Dewar cylinder also for pyrometric measurements by the principle of the water calorimeter pyrometer. It is only necessary to have a small lump of copper and an ordinary mercurial thermometer in addition to the Dewar cylinder in order to be enabled to make convenient, rapid and reasonably accurate measurements of temperatures up to 1000° C.

†Such an apparatus made in Germany, costs $1.12, duty-free.

GENERAL METHOD PROPOSED FOR THE ESTIMATION OF ALCOHOL IN PHARMACEUTICAL PREPARATIONS.

W. A. PEARSON.

It is with much timidity that I propose a general method for the estimation of alcohol in pharmaceutical preparations, because so much has been written on this subject and no two authors have agreed on any technic for the determina-

tion of alcohol in a single product, much less have they agreed on a general method for all pharmaceutical preparations.

The problem is made still more complex by the fact that the internal revenue officers demand that alcohol be determined at 60° F. (15.6° C), the Bureau of Standards desire to work at 20° C., while the Revision Committee of the United States Pharmacopœia have declared that specific gravity shall be taken at 25° C. Furthermore, many pharmaceutical products demand special treatment before the alcohol can be distilled from them unmixed with other volatile substances, even if the mechanical difficulties in the distillation have been eliminated. Unusual and expensive apparatus cannot be recommended unless such refinements will materially increase the accuracy of results; yet often the accuracy of the determinations are of so great commercial importance that every precaution must be taken to insure the best results. It is obvious that no general directions can be given that will be suitable for preparations where preliminary treatment is required before the distillation can be made; hence these directions must be specifically prescribed under each preparation in which the alcohol is to be determined, as is done in the United States Pharmacopœia, 8th Revision, in many cases preparatory to the carrying out of the tests for arsenic, and heavy metals.

General Method for Determination of Alcohol.

Adjust the temperature of the preparation in which the alcohol is to be determined to 25° C., then measure exactly 100 cc. of it into a 100-cc. graduated flask. Pour into a distilling flask having capacity of about 300 cc. and rinse the 100-cc. flask with several portions of distilled water, 30 cc. in all, and add rinsings to distilling flask. Add to the distilling flask any substances that may be especially prescribed, and connect the distilling flask with a suitable safety bulb, and this to a condenser. Distill nearly 100 cc. at the rate of about two cubic centimeters per minute into a narrow-necked pycnometer, which has been standardized and graduated to hold 100 grams of distilled water at 25° C.

Immerse the pycnometer to its graduation in water at 25° C. for one-half an hour and after that time fill to graduation with distilled water having a temperature of 25° C. Dry outside of pycnometer and inside of narrow neck nearly to graduation with a cloth and weigh. The weight of the contents of the flask, multiplied by 0.01, equals the specific gravity of the alcohol distillate. Compare this with U. S. P. tables showing specific gravity of alcohol at 25° C.

Acknowledgement.

Nothing original can be claimed for the method I have proposed and it will have served the purpose for which it was intended if its objectionable points are eliminated by criticism and suggestions so that a satisfactory general method for the estimation of alcohol in pharmaceutical preparations will be developed.

My sincere thanks are due Mr. L. Henry Bernegau and Dr. C. S. Brinton for their active cooperation, and also to Professor G. H. Meeker and Mr. M. Becker, who were not members of the committee, but who kindly consented to contribute their suggestions to help a worthy cause.

WEIGHTS AND MEASURES SHOULD BE GUARANTEED U. S. P. STANDARD.

JOSEPH W. ENGLAND.

There is probably no more important need in the pharmaceutical world than the necessity of having accurate and uniform weights and measures, especially measures of volume.

It is simply idle to standardize the more potent remedies of the Pharmacopoeia, with the greatest possible degree of accuracy, and then measure them with measures that are not accurately graduated.

As an illustration, three dozen 8-ounce graduates were purchased by Whitall, Tatum & Co., in widely separated localities and compared with the standards used in their factory. The results were startling. They were as follows:

Not *one* of the 36 graduated measures were accurately graduated.

Some were better than others, but all were bad.

On one graduate, the 6-ounce mark was correct, but all the remaining ones were wrong.

In one lot of twelve graduates, 6 fluid drachms of liquid were required to reach the graduation marked ½ fluidounce, a variation of 50 per cent.

All graduates should be required to be graduated by manufacturers, and marked, "Guaranteed U. S. P. Standard by ————," and pharmacists, for self-protection, should buy no other. *It is fully as important that weights and measures be guaranteed to be of U. S. P. Standard as it is of drugs.*

A standard graduate should be made of good flint glass properly annealed and properly graduated, the usual types being conical, narrow cylindrical and broad cylindrical. The best forms are of blown glass, not pressed glass. The annealing of the glass is done in lehrs or tempering ovens 75 to 100 feet long. The graduates go in at one end red hot, and in twelve hours comes out at the other end cold, properly annealed. It has been alleged that graduates may be annealed by placing them in cold water, bringing the water to the boiling point and cooling. But glass workers claim that such a method is of no practical value, as the temperature of the boiling water is not high enough to permit any great readjustment of the relative positions of the molecules of the glass.

The standard followed by Whitall, Tatum & Co. is 1 fluidounce=29.5161 grams of water when weighed in dry air at a temperature of 15° C., barometric pressure of 760 mm., the coefficient of expansion of the glass being assumed to be 0.000025 and the density of the brass weights 8.3. These figures are derived from the original data in use at the National Bureau of Standards of the United States, Washington, D. C., and the calculations are carried to any number of decimals necessary in the case of each instrument. The best method of graduation is that in which the graduates *deliver* the quantities indicated, every line in each graduate being determined by actual measurement. Where mechanical division is employed, the graduates will vary in delivery.

*Read before Pennsylvania Pharmaceutical Association, June, 1912.

There should be no variation in the delivery of graduates, other than that caused by the personal factor. In measuring liquids, the lower meniscus should be, of course, always observed; if the graduate is not held in a perfectly level position, more or less of the liquid will be measured, according as the graduate is tilted backward or forward.

Personal accuracy in the reading of graduates depends somewhat upon the diameter of the graduate at the point where the reading is taken. It is for this reason that the narrow cylinder is apt to be more accurate than the cone, and is preferred in analytical work; the cone is sufficiently accurate, however, for galencial work, and is more easily cleaned out.

The weights and measures recognized by the United States Pharmacopoeia are derived from or based upon those of the metric system as the United States Prototype Standards of the Meter and Kilogram in the custody of the National Bureau of Standards at Washington, D. C., and the system of Apothecaries Weights and Fluid Measures as used in England prior to 1825, the weights being originally derived from the old English Troy Weight, and the Fluid Measures from the Wine Measure. As is well known, the metric weights and measures are used in all pharmacopoeial work, while the Apothecaries' Weights and Fluid Measures are used by the physicians of this country in prescribing and the pharmacists in dispensing; the use of the metric weights and measures is exceedingly limited, but it is growing.

According to the U. S. P. (VIII), p. LIII, the standard temperature for the solubility of substances in liquids, for taking specific gravity and the volumetric operations in the Pharmacopoeia is 25° C. (77° F.); in the former revision it was 15° C. (59° F.) This change was made on account of its greater convenience and because it suited the greatest number of laboratory experts and pharmacists in the United States. In the case of alcohol and wine, however, the temperature of 60° F. (15.667° C.) was recognized for the present, since all the laws and regulations of the United States, referring to alcohol and alcoholic liquids in general, are still based on this degree of temperature.

The standard temperature used by the glass manufacturer for graduating measures is still 15° C., although the standard temperature was changed in the eighth revision of the Pharmacopoeia from 15° C. to 25° C., which it will be probably in the ninth revision; but this error will be doubtless corrected by the manufacturer as soon as the temperature for the ninth revision has been decided upon.

The standard fluidounce of water used by the manufacturer in graduating his measures is: 1 fluidounce=29.5161 grams at 15° C. The standard of the U. S. P. (VIII) is 1 fluidounce=29.5737 grams at the maximum density of water (4° C.) in vacuo. This is a very small difference, when the expansion of the water from 4° C. to 15° C. is considered; and proper adjustments will doubtless be made as soon as the standards of the ninth revision become official.

The use of graduated prescription bottles should be discouraged. They vary greatly in accuracy, and their use is a delusion and a snare. They are blown in moulds, and vary in content according to distribution of the glass in the mould. Sometimes this is more uniform and sometimes less, and hence, the quantities

marked on such containers must be inaccurate. There is no substitute in prescription work for an accurately graduated measure.

In conclusion, it should be added that the American-made glass graduates, in accuracy and appearance, are superior to the foreign makes, and much more likely to be in accord with U. S. P. standard.

CUDBEAR AS A PHARMACEUTICAL COLORING.*

GEORGE M. BERINGER.

Since 1874, when Hans Wilder[1] directed attention to the advantages of cudbear over cochineal and carmine as a coloring agent for pharmaceutical preparations, it has become very popular and is now extensively used. As a vegetable dye miscible with either slightly acid or alkaline solutions, with the production of acceptable shades of red, it has been used by many almost as a universal coloring where red colored liquids are wanted. Despite its extensive use and desirable tinctorial properties, one has but to note the criticisms in the phramaceutical press to learn that it has not proved entirely satisfactory.

The principal complaint has been the lack of uniformity in the color of preparations as made by formulas in which the tincture of cudbear was directed. This tincture as found in the drug stores is exceedingly variable, due in part to the variability of commercial cudbear and in a large measure to the imperfect extraction of cudbear by the official N. F. formula.

This tincture is directed in a number of the National Formulary recipes, and in the revision now in progress it has again been decided to retain cudbear as a coloring agent. The desirability of adopting a method of standardizing the tincture is obvious and a sub-committee on color standards have been giving earnest consideration to this vexing problem.

A few of the suggestions offered for this purpose may be here mentioned. One of the earlier thoughts was the publication of a color chart with the shades designated by numbers and to indicate in the formula for a preparation the number of the shade that the product should match. A similar suggestion was to color silk thread or woolen yarn to the desired shades, and chart and number these as guides. Tinted glass, especially that known as "ruby flash glass," was recommended for comparing acid solutions of cudbear. Tintometers were recommended, but these are beyond the reach of the average pharmacist and so not practicable. A novel proposition along this line was offered by Harvey I. Leith,[2] namely, that standard glass rods be prepared of definite diameter and length and colored in their manufacture according to standards established by the Committee on National Formulary. Each rod to have a groove at the top bearing a tag with a number indicating the color. A rod of the standard tint dipped into a preparation would not be discerned if the coloring matched; if the rod showed it

*Presented at the meeting of the New Jersey Pharmaceutical Association, Atlantic City, N. J., June 5, 1912.

[1]American Journal of Pharmacy, 1874—299.

[2]American Druggist, 1910—175.

would indicate that the preparation was off in color. None of these suggestions were found to be practicable. The question naturally arises as to the proper directions that would have to be given in such schemes to insure the manipulator matching the shade.

A more promising line of work has been the attempt to standardize dilutions of cudbear tinctures against chemical solutions of definite strength and color such as solution of iodine, solution of gold tribromide or an alkalized phenolphthalein solution. The latter, a suggestion of Mr. Otto Raubenheimer, has been more favorably considered by the committee, and will be more particularly referred to later on. Other methods suggested have been chemical, such as the determination of the tinctorial value by the amount of sulphurous acid or solution of sodium hypochlorite required to bleach out a specified volume of the tincture previously well diluted.

Chairman Diehl[3] is undoubteedly correct in his opinion "that any other than the simplest method of standardization will prove disastrous since it is not likely to be carried out by the average pharmacist." His suggestion was[4] "that comparison of the diluted tincture should be made with dilutions of the purest attainable form of the real active coloring principles." Prof. H. V. Arny[5] states that "orcein, the active principle of cudbear, was found to be of uniform tinctorial power and a solution of orcein 1 to 40,000 was found to match a dilution of 1 to 100 of a sample of tincture of cudbear."

If a purified cudbear or a satisfactory extract thereof of a uniform quality could be readily prepared, then the problem of standard red colored solutions would be simplified. Still better would be the isolation of the coloring principles in a reasonably pure condition. A tincture made with a definite proportion of such extract or coloring principle should not vary greatly and only slight difference of shades could exist in the preparations colored therewith. In the investigations of the writer he has endeavored to keep this thought continuously in mind and his experiments have been largely directed thereby.

Cudbear is one of the interesting group of dyes, orchil, cudbear and litmus, that are commercially produced from various lichens. Lichens contain in their tissues a number of different coloring principles, and E. Bachmann,[6] who studied this subject, distinguished by micro-chemical reactions sixteen different pigments, including greens, yellows, browns and reds of various shades. Moreover, various lichens contain colorless acids and ester-like compounds of orcin and closely related substances which, through the action of alkalies, air and water split to produce first *orcin,* which is itself colorless, but by the continued action of ammonia and air is converted into *orcein* and other colored substances. In former times, the ammonia needed was supplied by the use of stale urine. It is to be hoped that, with the modern methods of obtaining ammonia, this disgusting process is no longer practiced; yet the odor obtained from some samples seem to indicate the possibility of its continuance. By the use of different species of

[3]A. Ph. A. Bulletin, 1909—379.

[4]A. Ph. A. Bulletin, 1910—371.

[5]A. Ph. A. Bulletin, 1910—371. Also Practical Druggist, 1912—24.

[6]Pringsheim's Jahrbucher, Vol. XXI, p. 1.

lichens and modification of the process and of the alkali used, different end products are produced resulting in the commercial dyes named.

Cudbear is stated to be prepared principally from certain species of Lecanora and Variolaria. *Lecanora tartarea* of northern Europe is said to be the source of most of that in the market and hence this species has been named the cudbear plant or cudweed. The name cudbear was given to this dye in honor of Dr. Cuthbert Gordon, who introduced it as a dye into Great Britain in the latter half of the eighteenth century. As a dye it is indifferent to cotton, but valuable in the dyeing of wool and silk.

As a commercial product it is very prone to adulteration, and in pharmacy its use should be restricted to a selected article that has been carefully tested and found to comply with the standard adopted. While good cudbear yields an ash of from 5 to 12 per cent, some samples examined gave an ash equivalent to 30 per cent. This consists very largely of sodium chloride, which is a common adulterant and which according to Allen[7] "is sometimes added to reduce an unusually rich article to a uniform standard of quality." In one sample the writer found such an abundance of salt present that a portion crystallized out on evaporating the ammoniocial solution as directed in Hankey's process for ticture of cudbear.

As the coloring of cudbear is only slightly soluble in cold water I strongly advocate that all cudbear used for pharmaceutical purposes be first washed with at least five times its weight of cold water. On mixing cudbear with this amount of cold water and allowing it to macerate for a few hours, with accasional agitation before filtering, the aqueous solution removes most of the sodium chloride, some ammonium salts with their empyreumatic odor, as well as some organic products that are undesirable, such as undecomposed lichen acids, partly converted orcin and extractive. The washed cudbear is more readily extracted and loses scarcely any of its real tinctorial power. This is a simple refinement that should be introduced no matter what formula be adopted for the preparation of a standard tincture.

TINCTURE OF CUDBEAR AND ITS STANDARDIZATION.

It is impossible to entirely exhaust cudbear of its coloring, and in the preparation of the tincture it is safe to assert that the amount directed in the N. F. formula for Tinctura Persionis 125 gm. in the liter is not half extracted and that an equally satisfactory preparation would result if the cudbear be reduced one-half, and hereafter a tincture of not over 10 per cent drug strength should be directed.

The directions for the manipulation in the N. F. read exceedingly simple: "Pack the cudbear in a suitable percolator, and percolate it with a mixture of one (1) volume alcohol and two (2) volumes of water until 1000 c of tincture are obtained."

Cudbear is a most troublesome substance to percolate. It is difficult to moisten evenly and not infrequently a portion becomes pasty and other portions scarcely moistened, with the result that one is prone to obtain either channeling and uneven extraction, or more frequently clogging of the percolator, which may even completely stop the process. Consequently, if percolation is to be adopted, the plan

[7]Commercial Organic Analysis, Vol. III, pt. 1, p. 324.

of admixing with the cudbear an inert diluent must be resorted to. A number of substances, such as sand and ground pumice, which usually serve for this purpose with other refractory drugs, have not proved satisfactory with cudbear. In my experience ground cork has proved entirely satisfactory, about one-third to one-half of the weight of the cudbear being sufficient. The commercial ground cork of the factories, however, should not be used, as this is made from cork refuse and siftings and is full of foreign matters and dirt and has a musty odor. Unsightly corks, or even old corks if thoroughly cleansed by boiling with water and drying, will serve the purpose and these can readily be reduced to a powder, passing through a No. 20 to a No. 40 sieve by the use of an almond grater, a useful implement, that should be in every drug store and laboratory.

The official menstruum is likewise too weak in alcohol to serve as a solvent for the coloring matters present. Water alone is a poor solvent for these and alcohol is one of the best, and if the menstruum is to be hydro-alcoholic then a mixture of at least alcohol three volumes and water one volume is to be recommended. The coloring principles present in cudbear are in part, associated as ammonia compounds, and some are not soluble even in alcohol until alkali be added. Orcein, the most important dye constituent of cudbear, as found in the market, is but indifferently soluble in alcohol and its color is not fully developed unless ammonia or other alkali be present. Hence, ammoniacal extraction of cudbear seems to be indicated, and when the extraction is so made then the alcohol can be reduced to the amount needed as a preservative. This is the principle that has been followed in the formula for tincture proposed by Wm. T. Hankey:[8]

> Cudbear 125 gm., macerate for 36 hours in a mixture of ammonia water 125 cc. and water 1877 cc., shaking at intervals, then filter and wash the residue on the filter with water until 2000 cc. of filtrate is obtained. Evaporate the filtrate to 500 cc., then add 330 cc. of alcohol and sufficient water to obtain 1000 cc. of tincture.

This is a decided improvement on the present N. F. formula, but the extraction of the cudbear is far from complete, the ammonia directed being insufficient for this purpose. Moreover, the tincture made by this formula shows a tendency to precipitate.

It has been proposed to adopt the Hankey formula in this revision of the National Formulary[9] with the modification that the tincture is to be standardized by the method proposed by Mr. Raubenheimer. The directions being that 1 cc. of the concentracted ammoniacal extract mixed with 399 cc. of water and 1 drop of 1% solution of ammonia should match the color of the Standard Pink Phenolphthalein Solution. The Standard Pink Solution is to be prepared by mixing 1 cc. of Phenolphthalein T. S., U. S. P., with 2 drops of Solution of Potassium Hydroxide and sufficient distilled water to make 100 cc.

If these match, the dilution with alcohol and water is carried out as directed in the formula. If they do not correspond, then the amount of the cudbear solution required to match the standard is determined by a repetition of the color comparison and the proper degree of dilution or concentration is thus fixed. The standard tincture should be of such a strength that 1 cc. diluted with 199 of water should match the standard pink phenolphthalein solution.

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[8] A. Ph. A., 1908—p. 93.

[9] Bulletin of N. F. Committee No. 31—p. 363.

The writer experimented with standard color test solutions as proposed by Raubenheimer[10] and also with the solution of orcein 1 to 40,000 as proposed by Arny.[11] The latter had a more decided red tint than the dilution of the cudbear tincture prepared by the proposed formula and was more difficult to match. With some of the samples of tincture made by other formulas the dilution did not match the tints of either of these proposeed standards. It is apparent that while the amount of alkali directed to be added to the cudbear dilution (1 drop of 1% solution of ammonia) may be sufficient to develop the purplish tint desired in in a tincture made by ammoniacal extraction it would be inadequate for such a purpose in tinctures made by other formulas. This was all the more evident in the stronger tinctures resulting from my experiments. In some of these a nearer approach to an exact matching of tints was obtained by a modification of Raubenheimer's standard made by increasing the alkali and diminishing the phenolphthalein thus, 1 cc. of solution of potassium hydroxide, 0.2 cc. of phenolphthalein T.S. and distilled water sufficient to make 100 cc. Using all three of these solutions for comparison it was found difficult to accurately match some of the dilutions of the tincture. Comparisons were more readily made, however, if the standards were diluted to 200 cc., or one-half of proposed strength.

While these standards may serve the purpose for the comparison of tinctures made by the proposed N. F. formula they are not entirely satisfactory and they are of questionable value in determining the strength of cudbear tinctures made by other processes. In some of these, the directions given must be deviated from at least by the addition of more ammonia, and then it becomes difficult to determine in each case the exact amount of alkali that is required to produce the purplish pink tint to match that of the standard. An excess of alkali will produce a deep purple not at all comparable with the standards that have been proposed.

In order to make comparisons of different tinctures, the writer surmised that if sufficient alkali be added to the diluted tinctures to produce the full purple coloration then the strength of such dilution should be readily and more accurately estimated. Such a method would necessitate the selection of a standard purple solution of known value. It was hoped that the Arny orcein solution of 1-40,000 upon the addition of alkali would serve the purpose, but on trial it was found that the shade of purple it produced varied too greatly from that of cudbear solutions to be at all satisfactory. This is explained by the fact, as will be shown later, that the other color substances associated with orcein in cudbear materially influence the colors produced by the tincture and that they cannot be ignored. It is possible that a dilute solution of potassium permanganate may serve for such standard.

From the cudbear selected for the experiments, a number of samples of tincture of cudbear were prepared by different formulas. In all of these 125 gm. of the cudbear was used to the liter of tincture so as to make the comparison with the formula of the N. F. III fair. The cudbear was previously washed with 5 times its weight of water before extraction and ground cork used as the diluent. The products were tested by determining the amount necessary to be diluted to

[10]Bulletin Committee on N. F. No. 31—p. 364.

[11]The Practical Druggist, 1912, April—p. 24.

100 cc. to match as near as possible the proposed standards. Subsequently, a practical test was also added, the determination of the amount of each necessary to color 100 cc. of Aromatic Elixir, U. S. P., to a uniform color; 1 cc. of the sample made by the N. F. III formula being used as the basis of this test. The following tabulated statement shows the results:

No. Formula.	Arny Orcein Standard.	Raubenheimer Standard Phenolphthalein Pink Solution.	Beringer Modification.	To Color 100 cc. Aromatic Elix.
1—National Formulary III.	3. cc. after adding 3 drops NH_3 (1%).	2.4 cc. after adding 5 drops NH_3 (1%).	2.2 2.2 cc. drops NH_3 (1%).	1. cc.
2—Hankey's Recipe.	2. cc. after adding 2 drops NH_3 (1%).	1.7 cc. after adding 3 drops NH_3 (1%).	1.5 cc. after adding 2 drops NH_3 (1%).	.8 cc.
3—Menstruum—Diluted Alcohol.	1. cc. after adding 2 drops NH_3 (1%).	.8 cc. after adding 2 drops NH_3 (1%).	.6 cc. after adding 4 drops NH_3 (1%).	.3 cc.
4—Menstruum—Alcohol 3 vols. Water 1 vol.	.8 cc. Tint not well matched.	.5 cc. after adding 2 drops NH_3 (1%). Difficult to match exactly.	.5 cc. after adding 2 drops NH_3 (1%) not exactly matched.	.2 cc.
5—Menstruum—Alcohol.	1. cc.	.65 cc. Dilution cloudy and difficult to match exactly by addition of NH_3	.65 cc.	.22 cc.
6—Menstruum—Stronger Ammonia Water 25cc.; Alcohol 975 cc.; finish with alcohol.	1.2 cc.	.8 cc. Dilution too purple; comparison approximate only.	.9 cc.	25? cc. Not same tint.
7—Menstruum—Ammonia Water U. S. P. 1 vol.; Water 3 vols.; percolate 4000 cc. Evaporate to 750 cc. When cold add alcohol 250 cc. and water q.s. to make 1000 cc.	.8 cc.	.57 cc. a good match.	.6 cc. good match.	.2 cc.
8—Mix the cudbear with Hydrochloric Acid 25 cc. allow to dry and then percolate with alcohol to 1000 cc.	.5 cc. after adding 4 drops NH_3 (1% .	.5 cc. after adding 4 drops NH_3 (1%).	.5 cc. after adding 4 drops NH_3 (1%).	.2 cc.

While these experiments do not permit of the exactness of determinations made by the methods of chemical analysis, they are nevertheless sufficiently instructive to permit of the following deductions: The present N. F. formula gives the poorest preparation for the reasons explained. The formula proposed for the revision is not the best that can be devised, and does not extract the cudbear nearly as thoroughly as can be done by percolation with ammonia water, as in formula No. 7. If the N. F. is to adopt a formula in which the extraction is to be made with ammonia water then formula No. 7 is to be commended. The great increase in tinctorial power obtained by using a menstruum of proper alcoholic strength is proved, and if alcoholic extraction is to be the basis of the official formula, then formula No. 4 should be approved.

Formula No. 8 is based upon the principle of neutralizing the alkaline bases present in the cudbear and then extracting the liberated colorings with alcohol. The results are pleasing, the preparation is perfectly clear and keeps without change, which cannot be reported of the samples made by ammoniacal extraction which, after keeping for several months, show more or less tendency to precipitation. The product shades toward a brick-red on account of the free acid present, but on dilution gives a bright red to cherry-red. While the acidity might prove objectionable in some preparations the results indicate a method of using cudbear to advantage in some solutions where the trace of acid is not contraindicated.

THE COLOR CONSTITUENTS OF CUDBEAR.

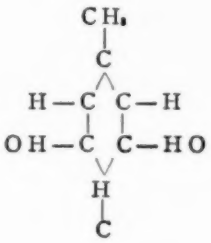
The text-books quite commonly are contented with the statement that the principal coloring substance present in orchil and cudbear is *orcein*. Still more common is the misleading statement that *orcin* in the presence of ammonia and air produces a colored substance *orcein*. No mention is made of any other colors produced by such exposure or oxidation and so generally the value of cudbear as a dye has been attributed entirely to the orcein content. The attempt to standardize cudbear and its tincture have likewise, in a large measure, taken the direction of comparing these with standard solutions of orcein. The assumption here again was that orcein represented all that was valuable or essential in cudbear as a coloring for pharmaceutical preparations. If such assumption was correct then the problem of obtaining uniform colored solutions with cudbear could be readily solved by the use of solution of *orcein*.

My experiments on the color constituents of cudbear were primarily undertaken with the thought of formulating a practical method of isolating the orcein in a state of sufficient purity to be used satisfactorily as a coloring in pharmacy. I have found it a most fascinating field of study, associated with peculiar and bewildering difficulties. The time at my command has not permitted of a thorough investigation of the colors isolated and the incompleteness of the investigation is admitted. Some of the results and conclusions are presented in this communication. It will be impossible to give herein all of the methods tried and many details of the experimentation are necessarily omitted.

The studies of E. Bachmann[6] indicate the complexity of the study of the lichen pigments. The numerous organic acids present in this family are in nature's laboratory largely converted into orcin. These acids have been the subject of elaborate investigations by many of the most prominent European chemists. The

facility with which they form esters further complicates the study and must affect the colored products resulting from their oxidation, and present in the commercial dyes.

Orcin is not only present in many of these lichens but is increased in the process of manufacture of the dye by splitting up the organic acids and compounds by heating with alkali. It can be produced by a number of processes and when pure appears in colorless, sweet tasting crystals, containing water of crystallization and melting at 58°. It is soluble in water, alcohol and ether.[12]. Chemically orcin is dihydroxy methylbenzene or Dioxytoluol $C_6H_3(CH_3)(OH)_2 + H_2O$.



Its close relationship to benzene shows that nature had anticipated man in establishing in her laboratory dye factories that simulated the process of the aniline dye chemists. The manufacturers of the lichen dyes have produced the same coloring materials from natural sources that can be duplicated in the chemist's laboratory by modern synthetic methods from definite chemical compounds. A priori, one could readily predict that orcin would yield a number of substitution compounds besides *orcein*.

Robiquet[13] was the first to observe that orcin in the presence of air and ammonia yielded a dye and named this body *Orcein*. This was further studied by Heeren[14] and Dumas[15] and Kane[16]. It was learned that orcein could be readily produced by exposing slightly moistened orcin in a watch crystal over a vessel containing strong solution of ammonia until it became brown and then dissolving this in water with the aid of a few drops of ammonia water and from this solution the orcein was precipitated by acetic acid.

From commercial orchil, orcein can be produced by moistening with hydrochloric acid, drying and then extracting with boiling alcohol. The alcohol is distilled off and the residue washed with water and then with ether when a carmine red powder remains.[17]

According to Liebermann[18] two dyes are produced by the action of air and ammonia on orcin. Both being brown amorphous substances with green lustre.

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[12]Schmidt Pharm. Chem., 1012.

[13]Ann. Chem and Phys. (2), 47—238.

[14]Schweigger's Journ. of Chem., 59—page 313.

[15]Ann. Chem. Pharm., 27—145.

[16]An. Chem. Pharm., 39—25.

[17]See Die Chemie der Natürlichen Farbstoffe, Dr. Hans Rupe, to which I am indebted for many of these references.

[18]Ber. d. deutsch. chem. Ges. 7, page 247, 8, page 1649.

The one which is the chief product when the ammonia is in excess is the least soluble in alcohol and ammonia.

Especially worthy of note was the investigation of Zulkowski and Peters,[19] who found that on allowing orcin to stand for two months over ammonia that three different dyes were produced: (1) Red orcein, which crystallized from hydro-alcoholic solution in microscopic crystals, which yield a brown powder. The solution in alcohol is carmine red and with alkalies and alkaline carbonates gives a blue violet color. It is insoluble in water and ether, soluble in alcohol and acetic acid and acetone. (2) A yellow crystalline dye material, which is soluble in warm water, alcohol and ether, giving a yellow colored solution. (3) A lackmus like dye, amorphous and insoluble in alcohol.

These authors showed that these three bodies would be produced in three days by mixing 100 parts of crystallized orcein, 200 ammonia water (22% NH_3) and 1200 of hydrogen dioxide 3%. The violet mass resulting is then acidified with hydrochloric acid, the precipitated orcein is collected and washed with water until no longer acid and then dried at a moderate temperature. On concentrating the filtrate and wash water and adding sodium chloride a second precipitate of orcein can be obtained. On washing the orcein with ether the yellow dye is removed. The orcein is dissolved off the filter by boiling alcohol and there is left on the filter a lackmus like dye material insoluble in alcohol. On evaporating the alcoholic solution of orcein it is obtained as brown crystalline powder. If water be added during the evaporation the orcein is left in glistening flakes.

The method of Zulkowski and Peters with ammonia and hydrogen dioxide was tried on a small scale, using Merck's orcin and the proportion of ingredients as stated. After allowing the mixture to stand for five days, the purple colored mass was solidified with hydrochloric acid and the precipitated orcein washed on to a filter with distilled water and the washing continued until the filtrate was free from acid. The filtrate was still of a bright red color and was washed with several portions of ether, when the latter became a deep orange color and yielded on evaporation a reddish orange residue and this was no doubt the yellow described by these authors. A small portion of this orange residue was soluble in chloroform and the chloroform was colored a distinct yellow not orange, and the residue from evaporation of the chloroform was much lighter in color and had much less tinctorial power. This would indicate that the yellow of these authors was composed of two compounds, the one soluble in chloroform and the other scarcely soluble in chloroform but very soluble in ether and present in relatively large amount.

The chloroform soluble yellow gave with ammonia a lilac-pink, and with hydrochloric acid a light yellow coloration. With alcohol the solution was yellow. It dyed silk in ammoniacal bath only an indistinct faint light pink, and in acid bath a maize yellow. For wool it had little affinity, and failed to dye in alkaline bath and in acid bath only a very pale yellow. The tinctorial value of this yellow was very slight. Owing to the small amount of material obtained the results were not satisfactory.

The orcin orange, the ether soluble yellow, in contradistinction gave orange

[19]Monatsh f. Chem. 11, page 227.

colored solutions in water and alcohol. With ammonia it gave a bright violet color, and hydrochloric acid changed this to light scarlet-yellow. The tinctorial strength was very marked. In acid bath it dyed both silk and wool a deep rich mandarin orange, and in ammoniacal solution silk was dyed a salmon pink.

The precipitated *orcein,* after washing free from acid, was dried on the filter and then washed with ether. The ether extracted considerable of the yellow dyes which had been carried down with the orcein and these reacted the same as that obtained from the wash water. The orcein was then extracted by washing the filter with hot alcohol and on evaporation the alcohol solution yielded a glistening residue which gave a red brown powder. There still remained on the filter a very small amount of precipitate not soluble in the alcohol. This gave with alkalies a distinct litmus like blue and with acids a red, and corresponds to the "lackmus like" dye reported by Zulkowski and Peters.

The orcein so obtained was almost insoluble in water and ether, and with alcohol gave a deep carmine red colored solution and in acetone a cherry red. With alkalies it gave a blue-purple and with hydrochloric acid a red coloration. It possessed strong tinctorial properties and dyed silk in acid bath Bordeaux red, and in alkaline bath purple. It dyed wool in acid bath a brownish-red, and in alkaline bath a violet blue.

The wash water from this experiment was still of a deep red color, even after having twice precipitated the orcein and washing with ether to extract the yellows, and showed that it still retained much coloring. It was washed with warm amyl alcohol, which removed nearly all of the coloring, leaving the wash water only slightly colored. The amyl alcohol solution was separated and washed with water to remove dissolved salts, and then evaporated on a water bath. It yielded a copious reddish purple residue. This was soluble in water and more readily in alcohol giving red-purple solutions. With ammonia the solution became intensely purple, and with hydrochloric acid reddish purple. It possessed powerful tinctorial value and dyed silk and wool, either in acid or in alkaline baths, beautiful shades of purple. This dye appears to have escaped the attention of other investigators, although present in considerable quantity, probably because they failed to examine the wash waters. Provisionally we will name it *Orcin purple.*

In order to determine the conditions under which orcin purple is formed and whether the presence of hydrogen dioxide influenced its production, a few test tube experiments were tried. It was learned that orcin in the presence of potassium hydroxide and water yielded largely the yellow dye. In the presence of ammonia in excess, and without any hydrogen dioxide being added, and allowing the oxidation to proceed only two or three days and not to completion, all three dyes, red, yellow, and purple were produced, the yellow and especially the purple exceeding the amount of orcein. Moreover, that the purple dye was soluble in ether when in ammoniacal solution and could be partly recovered in this way even before acidifying and precipitating the red. Excess of ammonia and incomplete oxidation are conditions that are to be expected in the process of manufacturing cudbear. It will be thus seen that orcein is not the only product resulting from the oxidation of orcin. While the blue or lackmus like dye and the yellow readily soluble in chloroform are present in such small quantity that they can probably

be ignored, the orange is present in notable amount and modifies the color of the red with the production of brighter shades. Under certain conditions the orcin purple is produced in quantity sufficient to materially affect the color.

Before taking up the Zulkowski and Peters' paper and process for experimentation, the writer had tried a number of methods for separation of the color materials from cudbear and some of these merit recording. The original thought was to obtain the coloring by precipitation as a lake with a metallic salt. Lead subacetate was found to most completely precipitate the coloring.

Process A—50 gm. of cudbear previously washed with 250 cc. of cold water was treated with successive portions of diluted ammonia water by maceration and the filtered solutions concentrated and solution of lead subacetate added so long as a precipitate was formed. The precipitate was washed by decantation and then on a filter until free from soluble lead salt. It was then suspended in water and a current of hydrogen sulphide passed through until the lead was entirely converted into sulphide. The mixture was then evaporated to dryness and the resulting mass powdered and divided into two equal portions. The one was extracted with warm alcohol and it was attempted to extract the other with diluted ammonia water. It was found, however, that the ammonia water softened the filter paper so that the lead sulphide passed through, and even after repeated evaporations and resolution the lead sulphide persisted in the filtrate. The alcoholic solution from the other half was evaporated and yielded a red powder. The yield was exceedingly small, and the tediousness of this process precludes its recommendation. The residue gave a bright red solution in alcohol, and with ammonia a purple coloration. The alcoholic solution had a pecliar fluoresence. To ether it yielded a yellow dye and from the ether extract water removed traces of a substance which on concentrating the aqueous solution and adding potassium hydroxide gave a pale yellow iridescent liquid with pale green and pink shadings. This was attributed to traces of organic lichen acids, and a similar reaction was obtained from the washings of the cudbear, and from other extractions.

Process B—50 gm. of cudbear was washed as previously directed, mixed with 10 cc. hydrochloric acid, dried and then extracted for 12 hours in a Soxhlet apparatus with alcohol. The extraction even then was not complete. The alcohol was distilled off and the residue evaporated to dryness on the water bath and reduced to powder. It was then of a purple-brown color and weighed 8 gm., equivalent to 16 per cent of the cudbear taken. This will be referred to as extract by acid alcoholic process. Five gm. was purified by washing with water and then with ether, as recommended in the published process. The ether was colored yellow and on evaporation gave the orange yellow dye. Associated with it was a small amount of a violet-red dye that was insoluble in chloroform.

The purified extract was now of a dull red color and weighed 1.75 gm. It gave with alkalies the blue purple coloration and dyed silk and wool the orcein shades. In accordance with the published statement it should be orcein. It was, however, far from pure and, although made by alcoholic extraction, was no longer entirely soluble in alcohol; a portion dissolved readily in alcohol and a smaller amount was very scarcely soluble even in boiling alcohol. This portion dissolved readily in ammonia water yielding a purple solution, but when reprecipitated by the addi-

tion of acid its solubility in alcohol, even in this freshly precipitated state, was not increased. This portion was likewise much weaker in tinctorial value.

Process C—50 gm. of cudbear was washed as in previous processes, then mixed with 25 gm. of ground cork and percolated with a mixture of ammonia water 1 volume, water 3 volumes, until 3500 cc. of percolate was obtained and the cudbear was fairly well extracted although not exhausted. The percolate was concentrated to 500 cc. and sufficient hydrochloric acid (25 cc.) was added to make the solution decidedly acid, then warmed and set aside for 24 hours for the precipitate to settle. The precipitate was collected on a filter and washed till free from acid, then dried and powdered. It yielded a red brown powder, which gave a purple solution with alkalies, and dyed silk in acid bath a light purplish red, corresponding to what is listed by silk manufacturers as crushed strawberry, and in alkaline bath a red violet. This impure orcein we will designate as *Perseo Red*. It is composed of two red coloring substances, one soluble in alcohol with a carmine red solution, the other practically insoluble in alcohol but soluble in ammonia water and the ammoniacal solution on evaporation yields a shining lustrous purple powder, which is insoluble in alcohol, but soluble in diluted alcohol to deep purple red solution. The experience with these red dyes obtained in both processes B and C seems to confirm the statement of Liebermann[20] as to the existence of two red dyes produced by oxidation of orcin with ammonia and air.

The filtrate and wash water from the precipitated perseo red was concentrated and extracted with ether, which extracted the yellow dye. Subsequent extraction with amyl alcohol yielded a brownish red solution and on evaporating off the amyl alcohol there remained a lustrous brown powder. This was soluble in water and in alcohol, yielding purple-red solutions, which on the addition of ammonia became a brighter red but not purple. It dyed silk in acid bath a heliotrope, and in alkaline bath an "old-pink" shade.

In attempting to isolate the different coloring matters present in cudbear, either by precipitation or by the use of immiscible solvents, one must recognize the difficulty of their separation in an absolutely pure state. Traces of the associated colorings are almost sure to adhere, and modify the shades produced in dyeing. Nevertheless, there are several well defined and distinct colors which are evidenced in every one of these methods and prove that in cudbear we have to deal with the orcein like reds, a yellow and the purple in varying proportions. The samples of the isolated dyes, colored solutions and dyed silk and wool fibers demonstrate this.

In order to compare the strength of the red dyes obtained in the processes described they were compared with a sample of orcein as supplied by Merck & Co. This orcein was insoluble in water, chloroform, petroleum benzin and benzene. In alcohol it gave a carmine red solution and its solubility in alcohol was increased by the addition of a small amount of ammonia. With methyl alcohol it gave a carmine red solution, with acetone a scarlet, and with amyl alcohol a deep pink. With ether it yielded a pale yellow solution; this filtered off, gave with ammonia a violet, and when acidified with hydrochloric acid was changed to a pink lilac color. It was noticed that on adding more ether, this at first remained

[20]Ber. d. deutsch. chem. Ges. 7, page 247; 8, page 1649.

colorless but gradually became yellow as if some change was taking place in the presence of that solvent.

Solutions of each of these red dyes were prepared by using .050 gm. of the dye, 5 cc. ammonia water and sufficient diluted alcohol to make 100 cc. The Merck's sample was taken as the standard and for comparison 1 cc. of its solution was diluted to 100 cc. with distilled water. The results were as follows:

Merck's Orcein.....	Solution, clear dark purple.	1 to 100 cc. Standard.
A—Red by Process A, not purified beyond alcoholic extraction.	Solution, clear, lighter red-purple.	5cc. to 100 cc.
B—Purified red by acid extraction	Solution, clear, purple.	2.25 cc. to 100 cc.
C—Perseo Red.....	Solution, clear, deep purple.	3 cc. to 100 cc.
D—Orcein by Zulkowski and Peters' method.....	Solution, clear, deep purple.	.8 cc. to 100 cc. Solution more blue as if trace of litmus present.

On acidifying dilutions of these solutions the red produced was similar to a litmus red, this was somewhat less marked in solution A. Aromatic Elixir colored by these lacked the attractive brightness of cudbear coloring. It was concluded that orcein must have a limited field of usefulness in pharmacy and that it could not displace cudbear with satisfaction.

EXTRACT OF CUDBEAR.

Desiring to obtain a preparation that would represent all of the colorings present in cudbear, extracts were made. Preliminary experiments showed the necessity of washing the cudbear with cold water to remove salts before extraction, if non-hygroscopic and powdered extracts were to be expected, and in these experiments this was always a preparatory act. Alcohol, acetic acid, ammonia water U. S. P., and a mixture of ammonia water 1, water 3, were all used as menstruums, as well as the acid-alcoholic hot extraction previously referred to. It was found that the resulting extracts could be dried and powdered but that they were not freely soluble in alcohol or water, but that with each complete solution could only be effected by the addition of ammonia.

For the comparison of these extracts solutions were made by the following formula: Extract .5 gm., Ammonia Water 5 cc., Diluted Alcohol sufficient to make 100 cc. The tabulated statement exhibits the results. Efforts to compare these with the Arny and Raubenheimer Standard Solutions were not satisfactory, and comparison was made by using the dilution of the solution of the alcohol extract as a standard.

Menstruum.	Yield.	Character of Solution.	Amount Required to Match Standard.
Alcohol	8.3%	Solution complete, sediment very little.	1 cc. to 200 cc. Standard.
Acetic Acid.....	11.2%	Poorly soluble and solution not completely effected.	8 cc.
Ammonia Water.....	13%	Solution complete.	3 cc.
Ammonia Water 1, Water 3.....	20%	Solution nearly complete.	2.5 cc.
HCl and Alcohol.....	16%	Solution nearly complete.	4 cc.

Aromatic elixir colored by any of these solutions was distinctly purple but

the red coloring was readily produced by neutralizing with citric acid. The use of an extract of cudbear would very materially reduce the variability in color of preparations in which it was used and it would also be available for the preparation of a more uniform tincture. Acetic acid extract is ruled out on account of its poor solubility and lack of strength. On the score of economy ammonia water extraction appeals but on the basis of strength and reliability alcoholic extraction is to be preferred.

THE DRUG MARKET.

HARRY B. FRENCH.

Senna Leaves.—The United States government is refusing admittance into the United States of what is known as Alexandria Senna Siftings. This is supposed to be the small leaves sifted out in obtaining whole leaf and half leaf garbled. These siftings are very often of good quality, but contain a large portion of sand and other foreign matter. We understand that the Government's limit of foreign matter and succeeded in reducing the percentage of extraneous matter to 9 per was sifted by us. The result was that we eliminated about 25 per cent. of foreign matter and succeeded in reducing the percentage of extradeous matter to 9 per cent. ash. This necessarily makes the price higher to the buyer, but he secures a better article. Ash insoluble in hydrochloric acid less than 1 per cent.

Opium.—Some time ago, we bought in Smyrna, dried opium of high test. This was sold to us as 22 per cent. On arrival we had it carefully tested and had this test corroborated by a prominent chemist in the city and the gum also is tested, at our request, by one of the very large manufacturing chemists in the city. The average result obtained was that the gum tested 20 per cent. U. S. P. Sample was also tested, as a favor to us, by a very prominent pharmaceutical house in the west, and they made the following very interesting report to us:

"Report on Sample of Dried Opium from Smith, Kline & French Co.
Laboratory No. C-3892.

"It is well known that there are several sources of error in the U. S. P. Opium assay, and also that other methods are not free from similar sources of error. One of the most fruitful sources of error is the difficulty of completely extracting the Opium and this varies with different samples of Opium, some being much more easily extracted than others. As the morphine is determined by the crystallizing out of a solution, a certain amount will be retained in the mother liquors and this amount will also vary with the character of the Opium. Another source of error is found in the impurities which may be weighed with the Opium, and here again the purity of the morphine is influenced by the character of the Opium. The above facts must be borne in mind by the comparing assays made upon any sample of Opium.

"In order to determine as accurately as possible the morphine content of this Opium, we have made 15 assays; 6 by the U. S. P. method and 9 by other methods. Our results may be summarized as follows:

"Adhering closely to the U. S. P. method, we have found an average morphine content of 20.2 per cent. Applying to these results corrections for the solubility

of morphine in the mother liquors, the average would be raised to about 21 per cent.

"Our average result obtained by other methods, where lime was used in extracting the Opium, was 22.8 per cent morphine. In our opinion, this result is nearer the true morphine content of the Opium than that obtained by the U. S. P. process, but we do not believe that any such result as this can be obtained by the U. S. P. method."

Trouble is apt to arise in buying Opium on test from foreigners unless it is distinctly understood that the only standard that will be accepted will be the U. S. P. test. Whatever results may be given by other tests, the only test of importance to buyers in this country is the test of the U. S. Pharmacopoeia.

Gum Arabic Sorts, which is used in very large quantities, is gathered in the vast district around Khartoum and it has been customary to bring in this gum by the various methods of conveyance that were available to the natives. It was largely transported on the backs of camels and taken to some port of shipment, being delivered chiefly to the Port of Soudan on the Red Sea. The consequence of this method of delivery was that gum was being constantly delivered over a period of many months. A railroad was recently completed from Khartoum to Port Soudan, and this year the gum was shipped from Khartoum by rail. The consequence was that the bulk of the crop of gum was all delivered within a comparatively short time. This was a new experience in the commercial history of the world. The result was that the tremendous deliveries of gum within a short time forced down the price to a lower range than was justified. In previous years the gum would have been arriving at the port of shipment up to the end of July in considerable quantities. As the large deliveries have been absorbed and the later arrivals have been much smaller, for the reasons given above, the price is advancing rapidly.

The early sales of Gum Arabic are apt to be the best. Photographs show the gum, before it is bagged, piled up like large hills. The sand, and fine stuff, which is of little value, is very apt to sift to the bottom, and consequently the first orders are apt to be cleaner than those that are filled later.

Quinine.—Afer the manufacturers' price had remained at 14 cents in quantity of 100-oz. cans for a number of years ,the price was jumped to 16 cents per oz., and shortly afterwards to 19½ cents per oz. These advances were due to decreased shipments from Java, and these decreased shipments resulted in much higher prices being obtained for bark when offered at auction in London, Amsterdam and other quarters. We understand these decreased shipments were not due to any decreased production, but to a combination among the planters to restrict their shipments in order to secure higher prices for the bark. We have a suspicion that in doing this they are acting in conjunction with some of the larger European manufacturers.

It is doubtful whether these higher prices will be permanently maintained, as the shipments have begun to greatly increase and assume even larger proportions than before the recent decrease in the quantities forwarded. It is human nature for a certain percentage of those who may have agreed together to restrict shipments to take advantage of their more honest associates. When these delinquen

cies are discovered the floodgates are loosened and the quantity shipped is largely increased.

Buchu Leaves.—The very high prices prevailing for Buchu Leaves during the last three years constitute a matter for wonder. The production does not seem to be greatly decreased. It is true that the British Government now levies a tax on crown lands where most of the short leaves grow, but this tax constitutes only a small percentage of the advance in the price. The advance must be due to either increased consumption or expert manipulation of prices; possibly both reasons play a part.

We understand that the next U. S. Pharmacopoeia will probably make the long Buchu Leaves official, as well as the short leaf. If, as we have been told, the long leaf is not so valuable medicinally as the short leaf, then the wisdom of such action may be questioned. Owing to the difference in the prices prevailing between the long leaf and the short leaf, some manufacturers are not waiting for the sanction of the Pharmacopoeia, but are turning an honest (?) penny by using the long leaf instead of the short leaf for manufacturing purposes.

Oil of Rose.—The price of Oil of Rose has taken to aviation. The normal price for the best quality was about $6 to $7 per oz. The present asking price from abroad for best quality is about $17 per oz. This latter price, however, is really intended to check buying until it can be ascertained how much Oil of Rose will be produced and at what cost.

For generations the sturdy farmers of Bulgaria sold their rose leaves for 2 cents per pound, and owing to this low cost, the manufacturers of Oil of Rose were able to supply fine quality at low prices. Last year some wicked men, inoculated with poisonous ideas of benefiting the common people, circulated among the Bulgarians and suggested to them that they could get 4 cents per pound for rose leaves as well as 2 cents per pound. They listened to the suggestion of the serpent and found that they could get the higher price. When people of this character once get the taste of a profit of this kind, it leaves a pleasant flavor and they are apt to bear it always in mind. The consequence is that probably the Bulgarian peasant will always hereafter ask a considerably higher price for his rose leaves than heretofore, and such is the weakness of human nature that he will probably persist in endeavoring to obtain still higher prices.

Because of the good price obtained last year, the amount of roses cultivated was greatly increased. We are told, we do not know with how much truth, because of this increased area that was planted and the consequent despoilation of the best rose bushes for planting, the production of the best bushes for the present year was, to some extent lessened. The last reports are, notwithstanding the increased acreage, the outcome would be not more than last year, and perhaps less. Some time ago Bulgaria had very cold weather and this was followed suddenly by very warm weather. This caused the leaves to fall from the plant. In the meantime, the demand is said to be growing. If extreme prices are reached this article will no doubt be heavily adulterated, and as it is well known, it is an article that is especially susceptible to adulteration. It appeals to men's imagination as an easy road to obtain somebody's else cash. Notwithstanding our advance in moral education over our fathers, still there are a remnant of

us in Israel who are still willing to make use of sharp tricks to increase our returns. For instance, as it is known, celery seed is now selling at a phenomenally high price owing to the short crop of last year. We received recently a report from a correspondent who has headquarters in the principal cities of Europe to the effect that a quantity of celery seed had recently been sold for export to the United States at very high prices, 25 per cent of which celery seed was composed of foreign matter or exhausted seed. But then, the Americans are rich and can afford to pay for such little pleasantries.

In this connection the following extract from the Perfumery and Essential Oil Record of June 26, 1912, is of interest:

"We are now beginning to receive supplies of new season's otto of rose, and we must confess to disappointment at the samples that we have so far received. The following are the characters of the best of the few samples that we have had so far, which, although fairly good, yet unquestionably contained alcohol:

Specific gravity $\frac{300}{15}$	0.8564
Optical Rotation	-C° 30′
Refractive Index	1.4588
Rrefractive after drying	1.4598
Refractive after washing and drying	1.4630
Melting point	20-31° C.

"Other samples furnished to us have been of the very poorest character, flagrantly adulterated, some of them to the extent probably of 40 to 45 per cent."

Cod Liver Oil.—This is subject to great variations in price. Some years ago there was a great shortage and manufacturers of established proprietary remedies using Cod Liver Oil paid as high as $110 per barrel. There is a suit recently instituted in Boston against one of these manufacturers for his refusing to accept delivery on account of a contract for Cod Liver Oil during this period. It was shown that some of the oil was seal oil, much of the so-called Cod Liver Oil was put up in old barrels that formerly contained various kinds of oil, and that much of the oil came from other places than Norway. In other words, the seller was trying to make "hay while the sun shone."

The production this year of Cod Liver Oil has been enormous, about twice as great as in the previous years, and is, we believe, the largest output on record. When oil is quoted at $14 in Norway, it costs about $20 here, including the duty. The refiners of oil are seldom willing to sell below $14 F. O. B. Norway, as they claim they can utilize the oil to better advantage by selling the crude Cod Liver Oil.

SMITH, KLINE AND FRENCH CO., PHILADELPHIA, JUNE 28, 1912.

Papers Presented to Local Branches

CATAPHORESIS OR IONTOPHORESIS.*

F. A. UPSHER SMITH, PH. C.

The separation or splitting up of a chemical substance into its elements by electricity is known as "electrolysis." The application of electrolysis to the art of healing is termed "cataphoresis." The word "cataphoresis" should apply only to medication with the basic ion or kathion, and the term "anaphoresis," which has been used for this form of treatment covers both, but is cumbrous to use. "Ionic Medication" is a simpler name, one that is easily understood. It consists in the introduction into the body of suitable medicaments in the ionic state. The substance acted upon is termed the "electrolyte." It must be fluid or semi-fluid and must necessarily be a conductor of electricity. When a substance is electrolysed the products are termed "ions," a name first coined by Faraday.

The ions are electropositive or electronegative. Electropositive ions, or kathions, have a strong affinity for and pass to the negative pole of a battery, on the well-established law that "likes repel and unlikes attract." For the same reason the electronegative ions pass to the positive pole of the battery and are termed "anions."

To take a special case, when two electrodes, a carbon plate and a zinc rod are dipped in water acidulated with sulphuric acid, and a copper wire is attached to the ends of the electrodes outside the liquid, a current of electricity is generated, and the water is split up, producing a stream of hydrogen at the negative pole and oxygen at the positive pole. In general, when substances are electrolysed in this way their metallic constituents behave in a similar manner to the hydrogen, and appear at the negative pole, while their acid products, like oxygen, are liberated at the positive pole.

In practice great care must be taken to apply the right pole for the particular purpose. It must not be thought that, because the electric current in a battery passes from the positive pole towards the negative, the medicament must be placed upon the positive pole so as to be carried by the current into the tissues. The truth is that when a substance is electrolysed by being placed on either pole of the battery, it is split up into a positive half and a negative half and these will necessarily pass to poles of opposite sign. The choice as to which should be applied depends upon which part of the medicament we wish to employ. Thus, in treating goitre by this method with potassium iodide, the drug is placed upon the negative pole of the battery. Iodine being an electronegative element it is naturally repelled by the negative pole and passes through the tissues to the positive pole,

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and is carried more or less deeply into the tissues, according to the strength of the current (amperage).

The general rule for applying drugs by cataphoresis is as follows: "Place the medicament on the positive pole to utilize the base, on the negative pole to utilize the acid." The positively charged kathions traveling to the negative pole (kathode) include hydrogen, sodium, potassium, lithium, lead, copper, iron, bismuth and the ions of alkaloidal bases. These are all set free at the positive pole and are therefore applied medically at the positive pole (anode).

The negatively charged anions traveling to the positive pole (anode) include most of the metalloids and non-metals and the following groupings: OH, NO_3, ClO_3, $C_2H_3O_2$, SO_3, C_2O_4, PO_4. These are introduced for medical purposes under the negative pole (kathode).

The anions travel against the current ,the kathions with the current. Dr.Neiswanger , an authority on the application of electricity to therapeutics, whose work I have drawn upon in preparing this paper, has said that there is scarcely a condition of disease but that electricity may be used in some form, either as an adjunct or a remedy, and that other remedies, which may not meet the indications as well, are frequently employed because of a lack of knowledge of the therapy of electricity.

The positive and negative poles of a battery have to be used with discretion, as shown by their different behavior, according to the following table:

	Positive Pole	Negative Pole
Reaction	Acid	Alkaline
Action on tissues	(A) Hardens by coagulating albumen.	Softens by liquefaction and disintegration
	(B) An acid caustic forming a hard cicatrix or scar	An alkaline caustic forming a soft cicatrix
	(C) Sedative	Increases sensitiveness
	(D) Hemostatic	Increases bleeding
	(E) Vaso-constrictor	Vaso-dilator

The application of a negative pole by making the tissues alkaline increases inflammation, which is a condition due to excessive alkalinity. When the positive pole is applied the inflammation and pain subside. Hence we see that the negative pole must be used to remove warts and moles, as the action of the negative pole is like that of caustic soda, i. e., softening, disintegrating and liquefying.

Advantages of Ionization. Ointments act, for the most part, superficially—they do not penetrate the deeper tissues so readily as do the ions. Ionization has many advantages, of which we may mention:

1. Easy application.
2. Localization of treatment.
3. Relative painlessness.
4. Activity of the drugs employed, because in the nascent state.

Method of Application. Several thicknesses of absorbent cotton gauze or absorbent cotton are used under the pad, and a fresh solution is used for each sitting.

The quantity of drug that penetrates the tissues is proportional to the magnitude of the current and the duration of the flow.

The solution of the proper strength is applied by means of a disc covered with a thick pad of absorbent cotton or guaze, or by a glass cup electrode. The *active* electrode is covered with a piece of pig's bladder, through which the ions are able to pass. The indifferent electrode is applied in any other convenient situation, either in the hand or on the abdomen or elsewhere.

The solutions are conveniently made of 1 per cent. strength, by dissolving 4.56 grains of the drug in each fluid ounce of distilled water. Among the most useful drugs used in this way are: magnesium sulphate, potassium iodide, sodium salicylate, sodium chloride, quinine acid hydrochloride, copper sulphate and cocaine hydrochloride.

Ionic medication has been successfully employed in alopecia, chloasma (pigmentation), lupus, ringworm, scars and sycosis. A valuable summary of the therapeutic indications of different chemical substances used in cataphoresis is given in Martindale & Westcott's "Extra Pharmacopoeia," from which the following notes are taken. It should be remembered that the drug is carried through the tissues of the patient who is situated between the two poles:

Antiseptics can be introduced to whatever depth may be required.

Cocaine, using a 5 to 10 per cent. solution of the hydrochloride, abolishes sensibility of the skin in 10 minutes. Suitable for minor surgery.

Copper ions have proved effectual in ringworm.

Lithium ions have been used for gout.

Magnesium ions, using a solution of magnesium sulphate, 20 grains to the ounce, have given good effects in multiple warts on the hands.

Mercury. A 1 in 500 solution of mercuric chloride, with the addition of 1 per cent. of sodium chloride is employed.

Morphine. Toxic results can be obtained.

Quinine Acid Hydrochloride. Excellent results have been obtained in trigeminal neuralgia.

Silver. Used in infective cystitis.

Sodium Chloride has a resolving influence on sclerotic and cicatricial formations, applying the kathode to the affected part.

Sodium ions. For the removal of superfluous hairs.

Sodium Salicylate. For neuralgia, sciatica, etc.

Zinc ions. A front rank antiseptic. There is no wound that can not be disinfected by its use. Rodent ulcer has been successfully treated with zinc.

A BRIEF REVIEW OF PROGRESS IN PHARMACY.*

F. A. UPSHER SMITH, PH. C.

Since the introduction of antipyrine in 1882, the therapeutic field has been flooded with thousands of new remedies, of which perhaps less than one per cent. are really valuable and necessary additions. The succeeding years have brought in the following important drugs: 1885, Urethane; 1886, Sulphonal; 1887, Acetanilide and Phenacetin; 1890, Trional; 1899, Aspirin; 1904, Stovaine; 1905, Novocaine. Tuberculin was introduced in 1890. Diphtheria Serum in 1892. A moment's consideration shows that the rapid and enormous multiplication of possible remedial agents has been in one sense a positive detriment to progress, because it has turned the attention of physicians from a limited number of drugs, chiefly vegetable or inorganic and inexpensive, to a legion of new drugs, largely chemical, complex in composition, and expensive to the point of extortion.

A glance through current literature might give the impression that these new synthetics represent recent progress in pharmacy. But a closer study of the subject reveals a very different state of things. The modern physician takes a wider view in his search for remedial agents. He ransacks the whole realm of nature in choosing his armamentarium, using a gas from the atmosphere, an obscure animal gland, a physical force such as electricity, a vegetable ferment, or an emanation from an element like radium, with the same naturalness as when he formerly prescribed the common drugs of the vegetable, mineral and animal kingdoms. For this reason the commentator on modern pharmacy must not limit his attention and interest to the commonly accepted drugs in the materia medica. In attempting a brief review of recent progress in pharmacy it will, therefore, be proper to refer to therapeutic applications and methods, rather than give detailed notes on a few selected remedial agents.

Lactic Ferments are used largely, not only for making buttermilk, but in the treatment of intestinal troubles, rheumatoid arthritis and exphthalmic goitre. They have been used with some success in gonorrhea, dysentery, diarrhea, constipation and a number of other troubles. In fact, they have been *tried* in a more or less empirical way for almost every conceivable disease, including hay fever.

Carbon Dioxide Snow has been introduced as a cauterant. When applied in the form of a pencil to naevi, warts, lupus, etc., it completely destroys the growth, usually in a single application. The process is simple and practically painless. It has been proposed to call this method of treatment crymotherapy, from the Greek word, krymos, Frost.

"606" or Salvarsan now seems likely to yield place to the improved form "Neo-Salvarsan," which will soon be on the market. It is stated to be easily soluble in water, forming a neutral solution to which the addition of caustic soda is unnecessary. The dose is larger, 0.9 gm. of Neo-Salvarsan being equal to 0.6 of Salvarsan. It is given by intravenous or intramuscular injection, preferably the for-

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mer. Up to March 30, one physician in Germany had tried the new drug on 269 patients with greater toleration than with Salvarsan.

Combretum, the plant so much vaunted a few years ago for the treatment of the opium habit, appears to have lost favor. It is probable that it merely served as a vehicle for the diminishing doses of morphine that were used in the treatment.

Collodion has recently been applied most successfully to the treatment of boils. A ring of collodion is painted around the boil, and the application repeated several times a day. This procedure has been found to exert a gentle and increasing pressure on the boil, which results in its bursting, the core being squeezed out at the same time.

Hormonal, or peristaltic hormone, is being used in the treatment of constipation. Harmones are the substances which give character to internal seretions, and which, on absorption into the blood, influence tissues and organs other than those from which they have been obtained. Specific hormones of physiological importance have been obtained from the testes, ovary, intestinal epithelium, pancreas, thyroid, suprarenals and pituitary body. Hormonal is an extract of the spleen. It came to be used because it was found that normal intestinal peristalsis is produced by a specific hormone which is stored chiefly in the spleen. The adult dose is 15 to 20 cc, by intramuscular injection.

Mercury Succinimide has been very widely tried in tuberculosis, but it would seem to have failed to justify the high hopes that were entertained as to its usefulness.

Hydrogen Peroxide can be ranked among the most useful drugs in the Pharmacopoeia. It has given good results as an injection in gonorrhea and in peritonitis, for the irrigation of sinuses and septic cavities and as a prophylactic gargle against cerebro-meningitis.

Bismuth Gauze is now largely used in place of iodoform gauze. It is odorless, non-toxic, less irritating, less expensive and more efficient. In packing cavities it remains sweet and odorless for many days. It is prepared by mixing 2 ounces of bismuth subnitrate with the same quantity of glycerin, adding gradually two and one-half pints of warm water, and passing about 20 yards of gauze slowly, about three times, through the emulsion.

Epsom Salt, in doses of 1 drachm, two or three times a day, has been found to be a cure for warts.

Oxygen. The inhalation of this gas is of great service in pneumonia, asthma, bronchitis, angina, phthisis, dyspnoea, and asphyxiation by drowning, by smoke or gas. It is a cardiac and respiratory stimulant.

Ergot. Old ideas as to the active constituents of this valuable drug have undergone considerable modification. A water soluble principle has been isolated ,which has an action allied to the active principle of the adrenal glands. Chemically speaking it is para-hydroxy-phenyl-ethylamine. It is found in putrid meat and in placental extract. It can be produced synthetically. It causes the rise in blood pressure and contraction of the uterine muscles characteristic of ergot. Ergotoxine is responsible for the production of gangrene in the cock's comb. The action of ergot on the uterus has also been ascribed to Ergotidine, beta-iminazoyl-

ethylamine. This substance also has been made by synthesis. It causes a lowering of blood pressure.

Chromium Sulphate has given remarkable results in the treatment of enlarged prostate. Cases have been recorded where the patint was able to dispense altogether with the use of a catheter after taking a course of treatment with this drug administered by the mouth.

Sodium Citrate gives very great relief in gastric pain. It interacts with the free hydrochloric acid of the gastric juice, forming sodium chloride and citric acid, in which medium the activity of the digestive enzymes is encouraged. The dose is 15 to 60 grains, in water. It is a beneficial addition to cow's milk in the feeding of infants, preventing the formation of big curds.

Thiosinamin, a substance obtained by the action of ammonia and alcohol on volatile oil of mustard, has secured a position in the newer materia medica. It has a remarkable action in softening scar tissue and removing strictures. Under the name Fibrolysin it is combined with sodium salicylate, in which form it is largely used. For the treatment of external scars, e. g., those following burns, it is applied in the form of mulls. Internally it is given by injection into the veins, muscles or subcutaneous tissue, or by rectal or vaginal injection. One of its most important applications is in urethral strictures, by electrolysis.

Sera and Vaccines. There are now but few diseases for which a serum or a vaccine has not been tried. Promising results have been obtained with a vaccine in the treatment of common cold, also in acne.

Scarlet Red, for medicinal purposes, is the Biebrich Scarlet R, Medicinal, also known as "fat ponceau." It is an entirely different compound from the dye stuff, also known as scarlet red. It is used to regenerate skin by its action in causing proliferation of the epithelium. It is used in the form of a 5 to 8 per cent. ointment. The results are said to be astonishing. Its use has been extended to the treatment of corneal and other ulcers.

Eosin and other fluorescent substances have come into use in the treatment of abscesses, especially in the presence of sunlight. It destroys the bacillus of tetanus.

Sterilization and Desiccation of Medicinal Plants. Bourquelot has been working for some years on the action of enzymes in plants. He has shown that these naturally occurring plant principles are responsible for many changes that take place in drugs during the ordinary process of drying and later in storage. He advises that the drying of drugs should be rapid and thorough in order to preserve the greater part of the active principles more or less intact. When it is desired to know the condition in which the active principles exist in the living plant, recourse must be had to sterilization with boiling alcohol. In the case of some tinctures made from fresh and dried drugs, such as those of aconite, colchicum, cloves and cinchona, a slow but progressive change occurs when these are made with cold alcohol. If the alcohol and drug be heated to boiling for a short time under a reflux condenser such changes will be avoided. A quicq and thorough drying preserves the glucosides from hydrolysis in a majority of drugs; in other words, it prevents the enzymes from reacting with the glucosides present.

Massol: A New Pill Excipient. An English pharmacist, Mr. P. B. Phillips, has suggested a new excipient for pills, under the name "Massol." It is made by the following formula:

Gelatin	40 grains
Glycerin	2 drams
Sugar	3 drams
Dist. water enough to make 1 oz.	

Place the gelatin in a tared dish with one-half ounce of water. After an hour add the glycerin and heat on a water bath until solution is effected. Add the sugar and heat until the mass weights 1 oz. Now beat the mass vigorously with a spatula until it sets and keep in covered jars.

Massol is claimed to be generally useful in making pill masses. It keeps well, and the beating incorporates a lot of air which whitens it, so that white powders can be made into white pills by its use.

The Phthalein Test is now used to determine the efficiency of the renal functions. Its use is described in the "Archives of Internal Medicine" of March 15. The substance used is phenolsulphone-phthalein. It is a bright red crystalline powder, somewhat soluble in water and alcohol and readily soluble in the presence of alkalies. It is non-toxic, non-irritant locally and is excreted amost entirely by the kidneys with great rapidity. In alkaline solution it presents a brilliant red color, which renders it very suitable for quantitative colorimetric determination. It is used in the form of an aqueous solution containing 6 mgm. to the cc, this dose being administered by subcutaneous, intramuscular or intravenous injection. In acid urine the collor is yellow or orange. The chemical part of the test is easily and quickly carried out.

SUGGESTIONS FOR THE IMPROVEMENT OF SOME U. S. P. FORMULAE.*

GUSTAV BACHMAN, PH. C., PH. M.

Liquor Potassii Arsenitis. The official directions for this preparation are: Boil the arsenic trioxide and potassium bicarbonate in a tared dish with 100 gm. of water until solution has been effected. Then add enough water to make the solution weigh 970 gm. and lastly add the 30 gm. of Compound Tincture of Lavender.

A person, upon reading these directions and without any further instructions, will naturally select an evaporating dish to carry on the boiling of the salts as directed. The U. S. P. further directs that 100 gm. of water are to be used instead of 100 cc. Why is it necessary to weigh the water, as some of it evaporates in bringing the arsenic trioxide into solution? A flask would be more suitable in preparing this solution. This would lessen the evaporation of water,

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and besides, one can readily see when all the arsenic trioxide is in solution, which is impossible when an evaporating dish is used. Again, there seems to be no good reason why the Compound Tincture of Lavender is to be weighed instead of measured, since enough water is finally added to bring the solution up to the desired weight. Even if the official directions for its preparation are carefully followed, a cloudy and unsightly solution is obtained. My experience with this preparation leads me to suggest a change in the formula and also in the directions for its preparation, as follows:

Arsenic Trioxide	10.00 gm.
Potassium Bicarbonate	20.00 gm.
Comp. Tr. Cardamom.....	50.00 cc.
Distilled Water, q. s.	1000.00 gm.

Dissolve the Potassium Bicarbonate in 100 cc. of boiling water contained in a liter flask, then add the Arsenic Trioxide and continue the boiling until solution is effected. Dilute this solution with 500 cc. of distilled water. To this add 50 cc. of Compound Tincture of Cardamom and lastly enough water to make the product weigh 1000 gm. Filter, if necessary.

Liquor Cresolis Compositus. The Pharmacopoeial directions for the preparation of this solution are as follows. Dissolve Potassium Hydroxide in 50 gm. of water in a tared dish, add the Linseed Oil and mix thoroughly. Then add the Cresol and stir until a clear solution is produced, and finally add enough Water to make the finished product weigh 1000 gm.

If these directions are followed it is impossible to make a preparation that will mix with water in any proportion without forming a cloudy, milky solution. This is objectionable and physicians are not prescribing the solution as often as they should. To remedy this difficulty, I suggest to dissolve the potassium hydroxide in 50 cc. of water instead of 50 gm. and to add to this solution the linseed oil, mix well and heat this mixture on a water-bath for one-half hour or until the oil is saponified; that is, until a little of the soft soap added to boiling water dissolves completely without leaving any oil globules floating on the liquid. From here on the directions of the Pharmacopoeia may be followed.

The finished product can be mixed with water in any proportion without forming a milky or cloudy solution.

A recent graduate from the College of Pharmacy of the University of Minnesota has made a reputation both for himself and for his employer among the physicians by making this solution according to the above directions.

Elixir of Iron, Quinine and Strychnine Phosphate. I venture to say that most druggists who follow the directions of the Pharmacopoeia in making this preparation are not satisfied with its manufacture. Many pharmacists have their own formula, simply because they can make it very much quicker, with less trouble than by the official method.

The official directions are to dissolve the alkaloids in the alcohol, then add the Phosphoric Acid and 350 cc. of Aromatic Elixir. The alkaloids are best dissolved in the alcohol by the aid of heat. If the Phosphoric Acid is added directly

to the alcoholic solution of the alkaloids, a thick precipitate is formed which is very difficult to redissolve. If, however, the Phosphoric Acid is mixed with the Aromatic Elixir before being added to the solution of the alkaloids this precipitate is avoided entirely. The further directions of the U. S. P. are to add the Acetic Acid to the Ammonium Carbonate and neutralize with Ammonia Water. The Acetic Acid is directed to be weighed while the Phosphoric Acid is measured. This seems impractical. Then, again, it is a long and tedious operation to get this Ammonium Acetate solution exactly neutral and this is quite unnecessary, as Sodium Citrate ,which is nearly neutral in aqueous solutions, will answer the same purposes as Ammonium Acetate in the making of this preparation.

The following formula has been worked out carefully and makes a satisfactory and presentable preparation. This is easily and quickly put together and I believe that more pharmacists will make their own elixir if this formula were used. The suggested formula is as follows:

Soluble Ferric Phosphate.....	17.50 gm.
Quinine (alkaloid)	8.75 gm.
Strychnine (alkaloid)	0.275 gm.
Phosphoric Acid	2.00 cc.
Sodium Citrate	8.00 gm.
Alcohol	60.00 cc.
Distilled Water.	
Aromatic Elixir aa q. s.	1000.00 cc.

Dissolve the alkaloids in the Alcohol with gentle heat; add the solution to the Phosphoric Acid, which has been previously diluted with 375 cc. of Aromatic Elixir. Dissolve the iron salt in 50 cc. of warm water and mix. Add this mixture to the alkaloidal solution gradually with stirring. A precipitate is formed at once, but this readily dissolves upon the further addition of the alkaloidal and iron solution. Finally, add enough Aromatic Elixir to make the product measure 1000 cc. and filter, if necessary.

Glycerite of Starch. The official directions are: Triturate the Starch with the Water until a homogenous mixture is produced. Then gradually add this to the Glycerin contained in a porcelain dish and heated to about 140° C. Continue the heat, with constant stirring, keeping it below 144° C. until a translucent jelly is formed.

I venture to say that nine beginners out of every ten making this preparation for the first time will triturate the starch with the water and then gradually add this paste to the Glycerin, previously heated to about 140° C. with the result that when this starch paste strikes the hot glycerin the starch becomes baked and the resulting lumps can not be worked out into a smooth jelly. I suggest that the directions read thus: Triturate the Starch with the Water, add this paste to the Glycerin gradually and heat the mixture with constant stirring up to 140° C. and keep at this temperature until a translucent jelly is produced.

THE PHARMACEUTICAL LABORATORY OF THE COLLEGE OF PHARMACY, UNIVERSITY OF MINNESOTA.

Section on Scientific Papers

Papers Presented at the Fifty-Ninth Convention

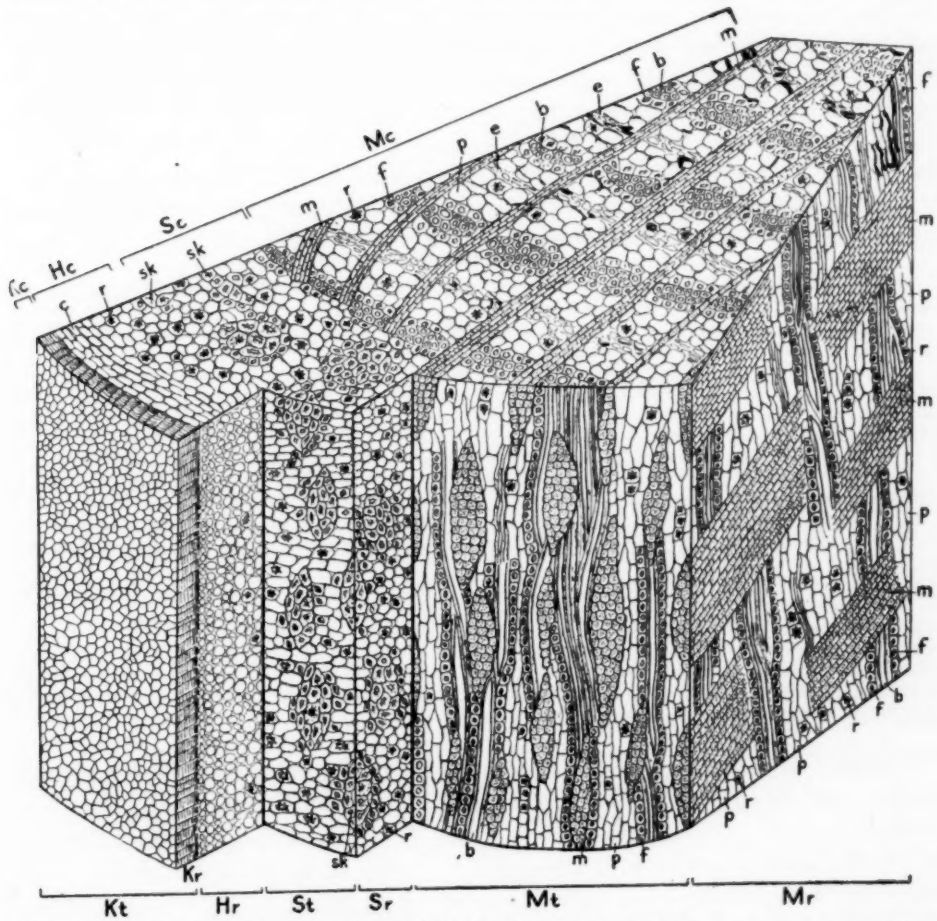
THE MEDULLARY RAY CELLS IN RHAMNUS PURSHIANUS.

HENRY KRAEMER, PH. D.

Pharmacognocists have been under the impression for some years that in the study of the medullary ray cells of more or less closely related drugs characters may be found that are useful in distinguishing between them. As a typical illustration of this point it has been stated that the medullary rays in Jamaica Quassia are from two to five cells wide while in Surinam Quassia they are one or two cells wide. As a matter of fact I have examined specimens of supposed Surinam Quassia, which were probably authentic in that they showed the absence of crystals, yet the number of cells in the width of the medullary rays closely agreed with that of Jamaica Quassia. Again, it is usual to attempt to differentiate between the barks of Rhamnus Purshianus and Rhamnus Californicus by reason of the apparent difference in the number of cells comprising the width of the medullary rays. I have been inclined to the view and have so expressed myself that the medullary ray cells in Rhamnus Purshianus are usually one or two cells wide whereas in Rhamnus Californicus they are three to five cells wide.[1] On account of the difficulty of procuring authentic specimens of R. Californicus I will not discuss at this time whether there is any actual difference in the number of cells of the medullary rays in these two barks. There is, however, considerable misapprehension on the part of different authorities in regard to the number of cells comprising the width of the medullary rays in R. Purshianus. For instance, Moeller[2] says that the medullary ray cells of R. Purshianus are from four to five cells wide, whereas in R. Frangula they are two to three cells wide. As a matter of fact these two barks are readily distinguished in powder or in section, by the absence of stone cells in R. Frangula. Vogl[3] in his commentary on the eighth edition of the Austrian Pharmacopoeia says that the medullary ray cells in R. Purshianus are from two to five cells wide, being mostly three cells wide. Karsten and Oltmann[4] in their Lehrbuch say, that the medullary ray cells in R. Purshianus are mostly three cells wide, but may occur as many as five cells in width, thus differing materially from R. Frangula. In the German Pharmacopoeia it is stated that the light yellow medullary rays of R. Purshianus are usually three to five cells wide, and seldom one or two. The Pharmacopoeia Helvetica states that the medullary ray cells of R. Purshianus are one to five cells wide.

The reason for these varying statements is probably due to the fact that most of the studies of crude drugs have been carried on with transverse sections. Owing to the interest in the study of powdered drugs in recent years, crude drugs are being examined in longitudinal section, but generally these sections are made

more or less haphazard and are probably mostly of a radial-longitudinal nature. Every student knows that in the study of cells and in the arrangement of tissues three views of them are necessary for a complete understanding of them, and these are obtained by making transverse, radial-longitudinal, and tangential-longitudinal sections. Ordinarily it may not be a matter of great moment as to what kind of longitudinal sections are made. But if a clear idea of the width as well as



The outer bark and part of the inner bark of Rhamnus Purshianus in transverse, radial-longitudinal, and tangential-longitudinal sections. **Mc,** transverse section of inner bark; **Mt,** tangential-longitudinal section of inner bark; **Mr,** radial-longitudinal section of inner bark; **Sc,** transverse section of stone cell area; **St,** tangential-longitudinal section of stone cell area; **Sr,** radial-longitudinal section of stone cell area; **Hc,** transverse section of outer layers, of cortex; **Hl,** radial-longitudinal section of outer layers of cortex; **Kc, Kt, Kr,** transverse, tangential-longitudinal, and radial-longitudinal sections of cork.
b, bast fibers; f, crystal fibers; p, parenchyma; l, sieve; sk, stone cells; m, medullary ray cells; c, collenchyma.

height of the number of cells comprising the medullary rays is to be ascertained it is absolutely necessary to examine tangential-longitudinal sections, in fact sections of this character are alone necessary, particularly when made of the tissues in the vicinity of the cambium. In this view the medullary ray cells occur in more or less bi-convex groups of a limited number of cells, extending more or less scattered throughout the tissues of the collateral and bicollateral fibro-vascular

bundles. It should be emphasized that these sections must be made in the area lying between the pith on the inside and the primary cortex on the outside. That is, in the bark, the sections must be made in the inner bark, because the medullary ray cells of the bark are included only in the phloem and this area does not usually extend throughout the width of the bark.

Coming to the drug which has been studied in order to illustrate this paper, it will be seen from an examination of the several sections, namely transverse, radial-longitudinal, and tangential-longitudinal, why there are these discrepancies throughout the literature in regard to the number of cells comprising the width of the medullary rays. This is especially brought out if these views are connected in a single drawing such as illustrates this paper. This illustration brings out clearly the relative position and arrangement of the tissuees in the bark and one sees how in the different sections different views are presented, none of which has a meaning without the others. The following points are to be observed:

1. That the medullary ray cells occur only within the tissues of the inner bark, that is, in those inside of the primary cortex.
2. That, in the transverse section the medullary rays appear as somewhat straight or curved lines, one to four cells in width.
3. That, in tangential-longitudinal section these occur in more or less biconvex groups. At both ends of these groups we usually find a single cell. As the convex area widens we find two cells side by side and then near the middle it may be three or four cells in width. I do not recall having seen as many as five cells side by side in the middle of these bi-convex groups. Some of the narrowed bi-convex areas may not be more than two cells in width.
4. That, in comparing the tangential-longitudinal section with the transverse section, the variation in the width of the rays becomes at once intelligible.
5. That, where the rays are one cell wide in transverse section either a very narrow bi-convex group has been cut across or the section has been made across the end of a broad group.
6. That, when the ray in transverse section is three or four cells wide, the section has been made through the middle of a broad bi-convex group.
7. That, in the radial-longitudinal section the medullary rays appear as a series of parallel lines, the number of cells in height depending on what part of the rays have been cut, and only if the section is made vertically through the middle of a group do we observe the maximum number of cells. The radial-longitudinal section, therefore, does not provide any additional information.

Probably sufficient has been said, in addition to the illustration here presented, to show the importance of the examination of tangential sections when studying medullary rays. This is important not only when attempting to find differences in closely related species of commercial varieties of drugs, but it is absolutely necessary in describing accurately the tissue which lies between the collateral and bicollateral bundles. When studies of this kind are made as, for instance, in the rhizome of cimicifuga it is almost immediately observed that the cells between the collateral bundles are not of the type of medullary rays, and again in the study of drugs like cinnamon and cinchona where in transverse section, in some cases at least, the medullary ray cells are more or less indistinct, they are almost immediately determined when tangential sections are made.

The medullary rays are of such a definite character in that they occur in more or less bi-convex groups when seen in tangential view that only a very few tangential-longitudinal sections are necessary to bring out the number of cells which make up their width or height.

In conclusion one other observation of interest may be mentioned and that is that the medullary ray cells near the cambium have a tangential diameter usually

much narrower compared with those found in the region near the cortex. For instance, the width of a medullary ray cell near the cambium will be about 0.010 mm., while the width of the cell in the same ray near the cortext will be 0.020 mm.

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Date.

THE CRYSTALLINE ALKALOID OF CALYCANTHUS GLAUCUS.

(Fourth Paper.)

SOME SALTS OF A NEW QUATERNARY BASE OBTAINED BY METHYLATION OF ISOCALYCANTHINE.

H. M. GORDIN.

It was shown in the last paper on this subject[1] that anhydrous isocalycanthine has the formula $C_{11}H_{14}N_2$, and that when recrystallized from a mixture of acetone and water it contains some water of crystallization the exact amount of which is difficult to determine, owing to the extreme slowness with which this water is given off. When the alkaloid is kept in vacuo over sulphuric acid, the loss of the water of crystallization is at first quite fast, but very soon slackens down to such an extent that it can be observed only when working with considerable quantities and weighing every month or two. I have now been keeping 1.9862 gm. of the alkaloid in vacuo over sulphuric acid for about twenty months. So far the loss amounts to 0.0894 gm. and the weight has not changed within the last two months. Supposing there will be no further loss, the amount of water of crystallization found would be 4.5 per cent, corresponding to half a molecule H_2O.

Calculated for $C_{11}H_{14}N_2.\frac{1}{2}H_2O$, 4.92 per cent. H_2O.

It was also shown in that paper that besides a CH_3N group, isocalycanthine contains an NH group, since when treated with nitrous acid, it given an insoluble nitrosamine. It was therefore expected that it would react with one molecule of methyl iodide to form a teritary methyliscocalycanthine of the formula $C_{11}H_{13}(CH_3)N_2$, and with two molecules of methyl iodide to form a neutral quatternary methiodide of the formula $C_{11}H_{13}(CH_3)N_2.CH_3I$. A large number of experiments showed, however, that whether the methyl iodide is in excess or the alkaloid is in excess, whether the reaction takes place in the cold or at 100° under pressure, in no case is either of the expected substances formed. Under all conditions so far tried the reaction products are as follows: About 35 per cent of the isocalycanthine taken takes no part in the reaction, and can be recovered unchanged; about 35 per cent of the iso calycanthine is converted into its hydriodide, while the rest is transformed into a new quaternary iodide having the entirely unexpected formula

[1] J. Am. Chem. Soc., 31, 1305.

$C_{24}H_{28}N_3IO.H_2O$. The relative quantities of these substances were determined by the following procedure. The whole of the reaction product, obtained after evaporating the methyl alcohol and the excess of methyl iodide to dryness, as described below, was taken up with dilute acetic acid (about 6%). The acid easily dissolves the unchanged isocalycanthine, but takes up only a small amount of the isocalycanthine hydriodide produced in the reaction, and still less of the new quaternary iodide which is very difficulty soluble in water or weak acids. From the acid solution the free unchanged isocalycanthine was obtained by precipitation with ammonia. From 10 gm. isocalycanthine taken about 3.5 gm. were recovered unchanged. The residue left after the treatment with the acetic acid was rubbed up with concentrated ammonia, which liberates the isocalycanthine left after the second treatment with acetic acid consisted of the new quaternary iodide. After standing over night, the ammoniacal liquid was sucked off, the residue washed with a little water, and then again treated with dilute acetic acid. In the new acid filtrate the free isocalycanthine was again precipitated with ammonia, yielding about 3.5 gm. isocalycanthine coming from its hydriodide. The residue left after the second treatment with acetic acid consisted of the new quaternary iodide. From 10 gm. isocalycanthine about 4 gm. quaternary iodide were obtained.

It is difficult to explain how from an oxygen-free base containing two atoms of nitrogen in the molecule, a quaternary oxygen-containing iodide is produced with three atoms of nitrogen in the molecule. It may be that the reaction consists not in a simple methylation, but that the methylation is accompanied by an elimination of an atom of nitrogen as ammonium iodide from two molecules of isocalycanthine under the combined action of the methyl iodide and the oxygen of the air, and that the large excess of free isocalycanthine drives out ammonia from the ammonium iodide, giving isocalycanthine hydriodide. The reaction could then be represented by the following two equations:

$$2C_{11}H_{14}N_2 + 2CH_3I + O_2 = C_{24}H_{28}N_3IO.H_2O + NH_4I$$
$$C_{11}H_{14}N_2 + NH_4I = C_{11}H_{14}N_2.HI + NH_3$$

An indication of formation of ammonia in the reaction was obtained by placing under the stopper of the flask in which the reaction took place a strip of moistened red litmus paper. After 24 hours' standing the paper turned decidedly blue. On the other hand, the amount of isocalycanthine hydriodide produced seems to be in excess of what might be expected considering the amount of quaternary iodide formed. But this discrepancy may be due to the difficulty of quantitatively separating the two substances from each other. The quaternary iodide being considerably less soluble in presence of ammonia than in neutral or acid liquids, undoubtedly dissolves to an appreciable extent together with the free isocalycanthine in the dilute acetic acid, and is then precipitated by the ammonia together with the free base. The amount found of quaternary iodide is therefore less, while that of isocalycanthine hydrodide, is more than is actually formed in the reaction.

The identity of isocalycanthine recovered from the reaction products, after purification by solution in acidified water, precipitation with ammonia and recrystallization from a mixture of acetone and water, was established by the melting point, optical rotation and the formation of an insoluble nitrosamine.

That none of the expected tertiary methylisocalycanthine is produced in the reaction is shown by the fact that from the acetic acid solution of the free base isolated from the reaction products, nitrous acid quantitatively precipitates the base as a nitrosamine. In the filtrate from the nitrosamine no basic substance could be detected by the usual alkalodal reagents.

That the new reaction product is really a quaternary iodide, not a salt of a tertiary or secondary base, is shown by the fact that ammonia, fixed alkalies and alkaline carbonates simply diminish its solubility in water, but do not precipitate any free base with the removal of hydriodic acid, and that nitrites in neutral solution give a rather difficulty soluble crystalline nitrite, while in acid solution no insoluble nitrosamine is formed.

The new quaternary iodide is both a neutral ammonium salt and a very weak monoacid tertiary base. Itself perfectly colorless and extremely difficultly soluble in water, it is capable of combining with strong acids to form much more easily soluble salts of a fine yellow color. From the solutions of such salts ammonia, fixed alkalies and alkaline carbonates reprecipitate the colorless quaternary iodide. By means of silver chloride the quaternary iodide can be changed to the corresponding quaternary chloride. The latter is quite soluble in water, and can be used for the preparation of other salts of the quaternary hydroxide underlying the quaternary iodide. All of these salts are colorless, except those with colored acids, like picric and picrolonic. They are all capable of combining with strong acids to form much more easily soluble salts of a fine yellow color. The amount of acid taken up by these quaternary salts can be exactly determined by titration with standard alkali, using as end point the disappearance of the yellow color. Further addition of alkali has no effect upon them. They all have a neutral reaction towards indicators, do not combine with weak acids, like acetic, do not react with nitrous acid and do not combine with methyl iodide, though they undoubtedly contain a tertiary nitrogen atom.

Attempts to corroborate the secondary nature of isocalycanthine by acting upon it with ethyl iodide, amyl iodide, benzyl iodide, orthoxylylene dibromide and benzenesulphochloride, were fruitless. In all cases the free base was quantitatively recovered unchanged.

The quaternary iodide or cloride can be changed by means of silver oxide to the corresponding free ammonium hydroxide. The hydroxide has a strong alkaline reaction and absorbs carbon dioxide eagerly. It could not therefore be prepared in pure condition. On heating the hydroxide to about 200°-220° in a current of carbon dioxide, it decomposes into two new substances, one of which is soluble, the other insoluble in dilute hydrochloric acid. These will be investigated later.

EXPERIMENTAL.

Having determined the exact nature of the reaction between isocalycanthine and methyl iodide, as described above, the best method for making the new quaternary iodide was found to be as follows:

Ten gm. crystallized isocalycanthine are boiled under reflux condenser with a mixture of 20 gm. methyl iodide and 30 cc. methyl alcohol for about 20 minutes.

The alkaloid quickly dissolves in the warm liquid, but very soon heavy crystals begin to separate out, and the boiling mixture begins to bump so violently that it is liable to be thrown out through the condenser. The flask is then detached from the condenser, cooled, stoppered and set aside for four or five days. A large amount of a mixture of white and yellowish heavy crystals separates out, firmly adhering to the sides and bottom of the flask. The supernatant liquid is poured off into a shallow evaporating dish, and evaporated to dryness at ordinary temperature in a good current of air. The crystals in the flask are now added to the residue in the evaporating dish, and the whole rubbed up with about 20 cc. of concentrated ammonia. The solid material is now almost perfectly white. After standing under cover for 24 hours, the ammoniacal liquid is sucked off, and the crystalline mass washed with water till the washings are free of ammonia. The mass is digested for a few hours with about 70 cc. dilute acetic acid (6%), and the acid liquid again sucked off, washing the crystals till the washings are neutral. In the acid filtrate the isocalycanthine is precipitated with ammonia, yielding about 6 gm. of free alkaloid. The new quaternary iodide left after the treatment with acid and amounting to about 4 gm. is recrystallized twice from methyl alcohol and dried at 30° for about 6 hours. Thus obtained the quaternary iodide forms snow white, light soft, glittering flat needles, insoluble in benzine, ether or chloroform, very difficultly soluble in water, a little more soluble in alcohol. Of hot methyl alcohol it requires about 30 parts for solution. It turns yellow on prolonged exposure to the air. It also becomes deep yellow upon addition of strong acids, but the color disappears again upon addition of ammonia, fixed alkali or alkaline carbonates. It contains one molecule of water of crystallization which it gives off in vacuo over sulphuric acid. Hydrated it turns brown at 213-14°, assuming a pasty consistence, but does not melt even at 265°. Anhydrous it turns darker and darker when heated, but does not melt even at 325° (on Bloc Maquenne).

The hydrated salt contained 4 per cent H_2O.

Calculated for $C_{24}H_{28}N_3IO.H_2O$, 3.47 per cent H_2O.

The analysis of the anhydrous salt gave: I, 25.52 per cent; N, 8.49 per cent; C, 57.21 per cent; H, 5.96 per cent.

Calculated for $C_{24}H_{28}N_3IO$: I, 25.32; N, 8.39; C, 57.46; H, 5.63.

0.1632 gm. of the anhydrous salt dissolved in 100 cc. methyl alcohol (Merck's pro analysis and redistilled) gave in 200 mm. tube at 23.5° a rotation of 0.62°. Hence $[d]_D^{23.5°} = 189.95$.

HYDRIODIDE OF THE QUATERNARY IODIDE, $C_{24}H_{28}N_3IO.HI.H_2O$.

Three gm. quaternary iodide and 4 gm. potassium iodide are dissolved with the aid of heat in a mixture of 10 cc. methyl alcohol and 10 cc. dilute hydrochloric acid about 10%). After standing for 24 hours the crystals which separate out are washed with a little water and dried at about 40°. Flat, bright yellow, silky needles, difficultly soluble in cold solvents, easily soluble in hot water or hot alcohol, insoluble in ether or chloroform. It gradually turns brown when heated, but does not melt even at 325°. The water of crystallization is given off in vacuo over sulphuric acid.

The hydrated salt contained 3.32 per cent H_2O.

Calculated for $C_{24}H_{28}N_3IO.HI.H_2O$, 2.8 per cent H_2O.

The anhydrous salt contained 40.30 per cent, total I.

Calculated for $C_{24}H_{28}N_3IO.HI$, 40.35 per cent I.

QUATERNARY CHLORIDE, $C_{24}H_{28}N_3ClO.3H_2O$.

Fifteen gm. quaternary iodide are shaken with an excess of freshly prepared silver chloride and about 300 cc. very dilute hydrochloric acid (about 1.5%) for half an hour and the liquid filtered. The clear deep yellow filtrate is made strongly alkaline with ammonia, which discharges the color immediately, and evaporated to a small bulk. On cooling the whole mass solidifies to a crystalline cake. After washing with a little water, the quaternary chloride is dissolved in methyl alcohol and the solution covered with ether. The crystals which separate out after 24 hours are dried at about 35°. Snow white, glittering, flat needles, easily soluble in methyl alcohol or hot water. Of cold water the salt requires about 50 parts for solution. It turns brown at 214° and melts to dark liquid at 220°. With gold chloride in presence of sodium carbonate it gives the same intense color reaction as calycanthaine[2], but the violet color is not so prompt to make its appearance. The water of crystallization is given off in vacuo over sulphuric acid. The anhydrous salt is very hygroscopic.

The hydrated salt contained 10.75 per cent, H_2O.

Calculated for $C_{24}H_{28}N_3ClO.3H_2O$, 11.01 per cent, H_2O.

The anhydrous salt contained 8.82 per cent, Cl.

Calculated for $C_{24}H_{28}N_3ClO$, 8.65 per cent, Cl.

0.2705 gm. of the anhydrous salt dissolved in 50 cc. water gave in 200 mm. tube at 24° a rotation of 2.67°. Hence $[d]_D^{24°} = 246.76$.

HYDROCHLORIDE OF THE QUATERNARY CHLORIDE, $C_{24}H_{28}N_3ClO.HCl$.

This salt is obtained by dissolving the neutral quaternary chloride in a mixture of methyl alcohol and a little concentrated hydrochloric acid, and covering the solution with ether. It is recrystallized from methyl alcohol covered with ether. Yellow microscopic needles, extremely easily soluble in methyl alcohol, quite soluble in water, but insoluble in ether or chloroform. Dried in the air it turns greenish at 155°. On further heating it becomes pasty, but does not melt to a liquid even at 250°. For the determination of HCl and total Cl it was dried in vacuo over sulphuric acid.

0.1523 gm. dissolved in 75 cc. water and titrated with 0.1 N KOH to disappearance of yellow color required 3.4 cc. for neutralization.

Calculated for $C_{24}H_{28}N_3ClO.HCl$, 3.4 cc. 0.1 N KOH.

The salt contained 16.17 per cent, total Cl.

Calculated for $C_{24}H_{28}N_3ClO.HCl$, 15.89 per cent, total Cl.

Attempts to prepare chloroplatinates and chloraurates of the quaternary chloride were not successful. Neither in acid nor in neutral solutions could salts of definite composition be obtained. The precipitates obtained by adding platinum tetrachloride or gold chloride to solutions of the quaternary chloride had a tendency to pass through the filter, and their color varied with the slightest change in

[2] J. Am. Chem. Soc., 27, 153.

the conditions of preparation. The platinum salt examined under the microscope consisted of a mixture of crystals and amorphous masses.

QUATENARY NITRATE, $C_{24}H_{28}N_3O.NO_3$.

The salt is prepared by dissolving the quaternary chloride in hot water and adding a saturated solution of potassium nitrate in water. It is recrystallized from boiling water and dried in vacuo over sulphuric acid. Snow white rectangular prisms, difficultly soluble in cold water, quite soluble in methyl alcohol and hot water. It turns yellowish at 190° and melts at 192-94° to a reddish liquid.

Analysis gave: C, 65.60 per cent; H, 6.22 per cent.

Calculated for $C_{24}H_{28}N_3O.NO_3$; C, 66.02; H, 6.47.

QUATENARY PICRATE, $C_{24}H_{28}N_3O.C_6H_2N_3O$.

The salt is prepared by dissolving 2 gm. of quaternary chloride in 500 cc. hot water and adding an excess of a hot solution of sodium picrate containing some free sodium carbonate. It is recrystallized from boiling water containing a little sodium carbonate and dried in vacuo. Soft, orange-yellow, oblong plates, difficultly soluble in all solvents. It turns reddish at 145° and melts at 155°.

It contained 13.96 per cent N.

Calculated for $C_{24}H_{28}N_3O.C_6H_2N_3O$, 13.96.

QUATENARY PICROLONATE, $C_{24}H_{28}N_3O.C_{10}H_7N_4O_5$.

The salt is prepared as follows: Sodium carbonate and picrolonic acid, one gm. each, are dissolved in 800 cc. warm water, and the solution set aside over night in a cool place. The liquid is filtered, and to the filtrate, heated nearly to boiling, is added a solution of one gm. quaternary chloride in 200 cc. hot water. The salt is recrystallized from boiling water, of which it requires about 2000 cc. for solution. Bright orange colored microscopic needles, very difficultly soluble in all solvents. Air dried it melts at 164-66° to thick liquid. For the estimation of N it was dried in vacuo.

The salt contained 15.86 per cent N.

Calculated for above formula, 15.38.

The investigation is to be continued.

NORTHWESTERN UNIVERSITY SCHOOL OF PHARMACY.

CALCIUM HYDROXIDE.

A Plea For Its Introduction Into the U. S. P.

PHILIP ASHER, PH. G.

The official method of making lime water is simple enough, and the principal question of interest is its only constituent, the lime, and which has caused an endless amount of unnecessary worry to those who have to make this solution.

The first difficulty the retailer meets is in obtaining lime of good quality.

Often lime is obtained which is difficult to slake, or, after having had it for a short time, one finds it has become air slaked and naturally it is thrown out.

The city druggist often experiences trouble in getting lime of good quality, and this difficulty is still greater in the country.

A common but highly erroneous practice is to slake lime in a demijohn, add water to it, and decant the clear solution when needed, adding water to the residue from time to time without limit.

Any intelligent pharmacist should know that a solution of calcium hydroxide absorbs carbon dioxide, forming the insoluble calcium carbonate. This notion that as long as there is a residue remaining it is calcium hydroxide is far more prevalent than one may believe and the writer has heard such a theory propounded from the lecture platform. While chairman of the Committee on Adulteration of the Louisiana State Pharmaceutical Association, 85 samples of lime water were examined, among which were some consisting of nothing but water, and strange as it may appear one of these was furnished by a member of the Board of Pharmacy.

It is seldom one meets with lime water containing an excess of alkali, but in the investigation above mentioned several such cases were observed, being due to improper washing.

Even were lime worth as much as 25 cents per pound and the full official amount were used a gallon of it would not cost half a cent, so that the charge of intentional cheapening could never be made against anyone. As an article of domestic consumption it is very important, and the pharmacist who supplies an inferior article is criminally negligent.

The writer undertook a series of investigations regarding the rate of the deterioration of lime and was surprised at the results.

That lime when exposed to the atmosphere absorbs carbon dioxide and water is correct, but the rate of such changes is not as rapid as generally believed. If a purified calcium hydroxide were introduced into the U. S. P. the pharmacist would have at his command the material with which to make lime water and without the necessity of washing.

On November 19, 1910, these experiments were begun:

"A"—Lime slaked, dried until it no longer lost weight, and placed in a 4 ounce, wide-mouth bottle, stoppered with an ordinary cork.

"B"—Same as "A," but kept in an open 4 ounce beaker and exposed to atmosphere.

"C"—Sufficient water was added to slake the lime and kept under same conditions as "A."

"D"—Same as "C," but kept exposed.

"E"—Lime placed in 4 ounce uncovered beaker and allowed to become air-slaked.

"F"—A preparation known as "lime opura," consisting of slaked lime. This was over six years old at the beginning of these experiments and was kept during that period in an ordinary cardboard box, and after the experiments were started was exposed to the atmosphere.

The following table shows the progressive changes.

Under "E" the reading is in terms of oxide instead of hydroxide.

It will be observed that the changes in the exposed samples during the first month were gradual, after which there was a decided drop, the latter occurring during the rainy spell, but since that time it has become almost stationary.

Date	A % $Ca(OH)_2$	B % $Ca(OH)_2$	C % $Ca(OH)_2$	D % $Ca(OH)_2$	E % CaO	F % $Ca(OH)_2$
November 19, 1910	88.51		88.25			
November 21, 1910	87.5	84.09	86.6	83.		
November 24, 1910	86.8	78.	86.5	78.	78.88	77.5
December 3, 1910	86.5	76.5	86.5	70.25	65.98	76.9
December 10, 1910	86.45	75.4	86.5	70.15	65.95	76.8
December 17, 1910	86.43	74.29	86.44	69.8	65.95	75.4
January 1, 1911	83.4	28.75	86.44	37.44	52.61	38.37
February 11, 1911	83.35	28.47	86.44	35.30	46.76	37.42
March 4, 1911	83.29	27.95	86.43	33.10	45.65	37.25
May 4, 1911	83.22	20.96	86.43	32.53	45.58	37.08
July 11, 1911	83.12		86.43	30.89	41.20	36.41

The results under "A" and "C" are of the greatest interest to the pharmacist, showing that with no other precaution than to cork the bottle the changes in nearly eight months were from 88.51% to 83.12% in "A" and from 88.25% to 86.43% in "B," or a difference of 6.3% in the former and 2.5% in the latter.

The above results also disclose the fact that even slaked lime could be used, provided an increased amount has been taken and which could be shown to contain hydroxide by a drop of phenolphthalein solution.

A purified calcium hydroxide could be made by the average retail druggist, but the chemical and pharmaceutical houses are better equipped for such work and it could be marketed at a very reasonable figure.

DISCUSSION.

CHARLES H. LAWALL: "I have frequently observed that milk of lime does not deteriorate as rapidly as commonly supposed if kept under common sense conditions. I am glad that Dr. Asher has made the tests that he did."

F. R. ELDRED: "There have been many elaborate schemes proposed for the keeping of lime water, such as siphons and similar arrangements. Some time ago I made seeral experiments as to the rate of deterioration of calcium hydroxide in solution. One was the keeping of a gallon of lime water with an excess of calcium hydroxide, the bottle being stoppered with an ordinary cork. Once a week the bottle was uncorked and two ounces poured out, without shaking, until only about two ounces of solution remained above the lime. The liquid remained saturated all the time.

"Another gallon bottle of the solution was kept with simply a paper cover to exclude dust, and every week a portion was removed by means of a pipette and titrated. While the liquid did not remain absolutely saturated it was above the pharmacopœial requirement at all times."

IMPROVEMENT IN THE TECHNIQUE OF SAMPLING URINE FOR MICROSCOPIC EXAMINATION.

G. H. MEEKER, PHAR. D., LL. D.

Let it be assumed, for the purpose of illustration, that an adult male will void about 250 cc. of urine each time he empties his bladder; that the total volume of his urine in twenty-four (24) hours is about 1500 cc., and that the clinician will

take as the sample for examination either the volume voided at a certain time or the total volume voided in a day. In both cases only a *single drop* is placed upon the microscope slide. This drop will measure about 1/20 cc. Under the foregoing circumstances, the microscope slide contains only (1/250 x 20 or 1/1500 x 20 = 1/5000 or 1/30,000) one five-thousandth or one thirty-thousandth of the whole urine sample. These figures will, of course, vary according to circumstances, but they serve to compel the conclusion that if the drop examined microscopically is to contain representatives of all solid particles in the main sample, then said drop must be obtained by a definite, intelligent procedure. The chance for error is reduced as we multiply the number of drops examined by the microscope; but the mere multiplication of examinations is both laborious and unintelligent. If we allow the urine to stand at rest until the particles subside, and then examine the subsided particles, we still further reduce the chance for error; but such a long time is required for complete subsidence of large samples of urine that the delays and fermentative changes encountered in this procedure become objectionable. Mere sedimentation by gravity has therefore given way largely to sedimentation by the centrifuge. The centrifuge gives results quickly and without the objectionable fermentation. We find some clinicians, however, who insist that the centrifuge does not effect sedimentation as perfectly as does gravity; and who refuse for this reason to abandon the gravity method.

I will now describe a procedure for the sampling of urine for microscopic examination, which is rational and which through long and satisfactory use in my laboratory has been approved by experience.

THE PROCEDURE.

Shake the sample so as to make it homogeneous. Take two conical centrifuge tubes, each having a capacity of about 20 cc. Label the tubes "a" and "b." Into each tube put about 15 cc. urine. With the contents of "b" mix one drop of a one per cent solution of ammonia alum, followed by a drop or two of ammonia water, if necessary, to produce a faint alkalinity. Now rotate both tubes until sedimentation appears to be complete. Remove the tubes from the centrifuge and pour off the clear liquid. Next introduce a small, pointed pipette into the sediment, as shown in the illustration, and blow gently through the sediment. Using the pipette, transfer a drop of the turbid material to a slide. Again mix the sediment by blowing through the pipette and again prepare a slide. We now have four slides—two from "a" and two from "b." To "a" now add one drop of any staining fluid desired, and to "b" add a drop or two of an acidified staining liquid, or enough to dissolve the earthy phosphates and aluminum hydroxide present. Having allowed sufficient time for the staining action, prepare four more slides as described above. A cursory examination of the eight slides with the ⅔″ objective and a more detailed

examination of one or two of the slides under the 1/8" objective completes the study.

A few explanations follow: The two 15 cc. samples taken from the well-shaken urine are each fully large enough to include, in correct proportion, all of the kinds of suspended solids in the main specimen. The use of the alum in alkaline solution insures the formation of a coagulum which entangles and precipitates all morphologic elements of the urine and checks the findings in test tube "a." The sediment must be mixed before taking the drop upon the slide because the solids do not settle uniformly. The illustration, Fig. 4, shows one of the centrifuge tubes ready for taking away the drop for microscopic examination—AD is the pipette; BD is the centrifuge tube; and CD is the sediment with accompanying liquid.

THE DETERMINATION OF THE CHEMICAL REACTION OF URINE.

G. H. MEEKER, PHAR. D., LL. D.

One having but little experience with the use of litmus paper in determining the chemical reaction of urine would think that no test upon the urine could be more simple in performance or more certain in its results. As a matter of fact, however, there are many fallacies in this apparently simple test. The fallacies arise mainly from the use of dry litmus paper and from the ofttimes faintness in the change of tint. The eye needs a control color-guide in order to render the results certain. I have for several years been employing, with much satisfaction, the following procedure, in which I believe the chances for erroneous results have been eliminated:

HOW TO CONDUCT THE TEST.

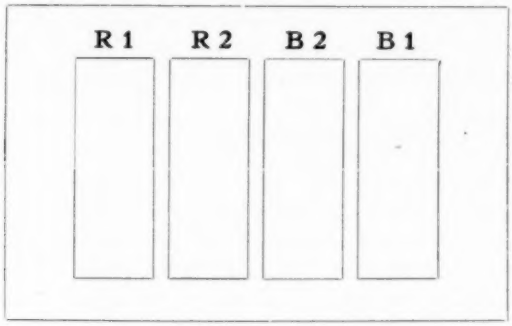
Half fill a small beaker with urine. Lay a clean white tile (or any other clean glazed surface) upon the table near the beaker. Take up two slips of red litmus paper—which for clearness in description we will call R 1 and R 2. Wet both slips of red litmus paper with neutral water. Lay R 1 upon the tile and hang R 2 against the side of the beaker so that the paper adheres to the beaker and is about two-thirds immersed in the urine. Take up two slips of blue litmus paper—B 1 and B 2, and proceed as with R 1 and R 2. After R 2 and B 2 have remained in the urine three minutes, remove them and lay them beside R 1 and B 1 on the tile. The order upon the tile should be R 1, R 2, B 2, B 1, as shown diagrammatically below. The tints will now lie side by side and the eye can readily detect any color change that may have occurred.

There are three possible alterations in tint: I.—Of R 2 to bluish, which means that the urine is alkaline. II.—Of B 2 to reddish, which means that the urine is acid; and III, of R 2 to bluish and B 2 to reddish, which means that the urine is amphoteric.

If an alkaline reaction be observed, it is important to determine whether or not the alkalinity is due to ammonium carbonate. To gain this information, heat the tile gently until the four slips of litmus paper upon it are thoroughly dried. If

R 2, which had become bluish in the urine, regains its reddish tint by drying, then the alkalinity of the urine is due to ammonium carbonate. (This means that the bladder is infected.)

If R 2 becomes frankly blue, the urine is said to be sharply alkaline. If R 2 becomes but faintly bluish, the urine is said to be slightly alkaline. Similarly, when B 2 becomes frankly red or faintly reddish, the urine is said to be respec-



tively, sharply acid or faintly acid. It is my experience that in health the most common reaction for the mixed urine for twenty-four hours is the amphoteric reaction and not the acid reaction, as is customarily stated.

NOTES.—R 2 and B 2 are apt to fade slightly where immersed in the urine, due to solubility of the coloring matter, but no importance is to be attached to this change. The hands, if not washed carefully, are apt to have some unsuspected power to change the color of litmus paper.

REPORT OF THE COMMITTEE ON THE U. S. PHARMACOPOEIA.

L. D. HAVENHILL, CHAIRMAN.

The work of the committee this year has been very much handicapped. It has suffered the loss of both of its efficient officers, Chairman George M. Beringer resigned, and Secretary C. S. M. Hallberg, by death. Because of subsequent misunderstanding, the committee was not reorganized until late this spring. The short time then remaining and the fact that five of the members are actively at work in the Pharmacopoeial Committee of Revision and two in the Committee on the National Formulary, made it inadvisable to attempt concerted action along any line of investigation. The report, for these reasons, will necessarily be brief and confined to a few miscellaneous topics.

Aquae. Considerable complaint is heard concerning the use of Purified Talc as a distributing agent in the preparation of the aromatic waters. Mr. Mittelbach says, in this connection: "I do not like Talcum or Magnesium Carbonate or any

of the distributing methods for the preparation of the official waters. One is nearly as bad as the other. I believe if all the official waters were made by distillation, we would have ideal ones. I believe that this would add much to their keeping properties. If stronger Rose and Orange Flower Waters keep so well, the others will also." The chairman endorses the above; distributing powders are not satisfactory; the ideal product would be one made by distillation. He believes, however, that distillation is a little too tedious to appeal to the majority of pharmacists and has, therefore, been advocating for several years the making of the waters from the respective oils by solution in hot water. The process requires but little attention from the pharmacist, the product is practically sterilized, saturation is secured, and traces of empyreumatic substances are volatilized. Its only weakness lies with the quality of the oil. This process is recommended in the British Pharmaceutical Codex in preference to the distribution method. The chairman's experience with the imported (so-called) rose water has not been satisfactory. He has not found it superior in any respect to that made from a high-grade oil of rose by the hot process. The Rose Water of the German Pharmacopoeia is prepared by dissolving the oil of rose in hot water.

Aspidium. Much of the male fern of the market does not conform to the U. S. P. description. It is very largely composed of "fingers" which, it is understood, are the peeled stipe bases. It would be very desirable to ascertain if these are equally active with the rhizome and if so to include them in the official description. It may be that much of the complaint that we hear concerning the inactivity of the oleo-resin of male fern may be traced to this source, instead of to the use of rhizomes which have not retained their internal green color. If so, these "fingers" should be specifically excluded.

Benzoinum. The question is raised concerning the amount of Siam Benzoin that is used in medicine. Its price, when compared with the Sumatra Benzoin, is very much against its ever being used as a substitute for the latter. If retained it ought to be specially described, as good samples are almost wholly soluble in alcohol. Sumatra Benzoin is nowhere near soluble in alcohol if the accompanying sticks and pieces of bark are to be considered as a part of the sample. This inert material often exceeds 40% and it is obvious that the U. S. P. must place some limit on it or else introduce a purified benzoin. A very good looking sample will often contain 20% of this material and it is believed that a limit of 20% for wood and bark would be liberal. The limit of ash should not be increased beyond the present limit of 2%.

Cera Flava. Considerable of the domestic bees' wax is produced in apiaries in all of which it is the custom to use "starters," "foundation" or "guide combs." Bee men claim that the wax produced from such combs will not comply with the U. S. P. requirements. If it can be shown that the starters can not be made from pure wax, then the desirability of lowering the standard for bees' wax should be considered.

Extractum Rhamni Purshianae. The chairman has not succeeded in reducing this extract to a pulverizable condition on a water-bath at a temperature of 70° C.

He has also found several samples in which the percentage of dry extract was greater than 25%.

Oleum Lini. Several states have adopted the U. S. P. standards for Linseed Oil in their paint and oil laws. This is, to a certain extent, unfortunate, unless the U. S. P. oil is none too good for commercial purposes. If the U. S. P. standards are to serve commercial purposes, they should be elaborated. A bland taste does not seem to characterize the taste of linseed oil. We have tasted of many samples which had a decidedly bitter taste. Should they be condemned on the taste? The length of time, the temperature, the circulation of air, and other conditions ,greatly influence the rate of "drying." These should be definitely stated in the resinification test. An acid number would be desirable to limit free acid. Our understanding is that a linseed oil of high grade may contain as much as 1.5% of unsaponifiable matter; if this is correct, the statement that it is completely saponifiable, etc., should be modified. Glacial Acetic acid has not given satisfaction in the rosin oil test. The originators of this test used acetic anhydride and it, instead of glacial acetic acid, should be used when making this test.

The Association of Official Agricultural Chemists is advocating the substitution of the Hanus method for the Hübl method for determining the iodine numbers. Their reasons should be considered with respect to a similar substitution in the U. S. P. A chemical test for the detection of fish oils is very much needed.

Oleum Terebinthinae. This is another substance for which the official tests are made the basis of commercial valuation. The tests for the presence of rosin spirit needs strengthening and a test for coal tar oils would be welcomed.

Pulvis Aromaticus. The chairman has submitted this formula to a number of pharmacists and finds that it is not clear as to whether it calls for 15 gm. of Cardamom or 15 gm. of Cardamom seeds. The same lack of clearness is found in the formula for Extract of Colocynth, though in this case it is immaterial whether the seeds are removed before or after weighing.

Pulvis Effervescens Compositus. In preparing these powders it is all right to dry the Tartaric Acid and the Sodium Bicarbonate, but when it comes to drying the Potassium and Sodium Tartrate, which contains about 25% of water of crystallization, one might question whether drying is synonymous with exsiccation. The question again comes up whether the drying is to be done before or after the weighing. This is an important matter when it comes to question of deciding the standard weight of the contents of the blue paper.

Sulphur. It seems highly improbable that a sublimed sulphur which contains 0.5% of non-volatile matter will yield a washed sulphur which will contain not more than 0.2% of non-volatile matter. The chairman attempted to verify this experimentally and up to date has examined 11 samples. He has not found one which contained as much as 0.5% of non-volatile matter. The range has been from 0.006% to 0.1%. This is less than that allowed in washed sulphur and the conclusion is reached that the allowance in the latter article is liberal enough and that there is little if any necessity for a difference in this requirement in the two.

articles. On the other hand, he has never examined a sample of Precipitated Sulphur which was free from non-volatile matter. It does not seem reasonable that there should be such a sample. It is suggested that a maximum limit of 0.3% be allowed in each, Washed, Sublimed and Precipitated Sulphur. Among the samples of Sublimed Sulphur examined there was a noticeable difference in the colors. Some were very pale yellow and looked more like pulverized than like sublimed sulphur. These pale yellow samples were not free burning and appeared to be impure, though they did not contain more than a few one-hundredths of one per cent. of non-volatile matter. The statement is made in the Pharmacopoeia that Sublimed Sulphur is readily soluble in Carbon Disulphide. It is believed that this statement should be modified. Most text-books state that it is only partially soluble in Carbon Disulphide and that the amount of insoluble sulphur may amount to as much as 6%. We have examined several samples and find that content of insoluble sulphur is usually about 4.5%. If the Purity Rubric is to remain an assay method ought to be supplied.

This committee, in its report last year, presented a list of general principles bearing on the IX rev. of the U. S. Pharmacopoeia. Supplementing these, we would like to suggest concerning No. 16, which relates to the fineness of powders, that there be a minimum requirement to the effect that not more than 25% of the powder of a given fineness should pass through a sieve having 10 meshes more to the lineal inch. The diameter of the wire should be stated in millimeters rather than by gauge, as different gauges are used for brass and iron wire, respectively.

Concerning No. 18, which relates to synonyms, this year's chairman feels prompted to dissent. He sees no reason why synonyms should be perpetuated by publishing them in the Pharmacopoeia.

Concerning No. 23, he agrees that structural formulas would be out of place in the U. S. P., but he would not like to have this so interpreted as to eliminate the constitutional formulas now used. Empirical formulas for organic chemicals are of but little value.

The pharmacist is frequently called upon to prepare saturated solutions. The solubility figures of the U. S. P. are not suitable for this purpose, since the resulting solution will, in the majority of cases, be supersaturated. The former figures at 15° C. were of more value for this purpose.

We believe that the question of percentage solutions should be decided by the Pharmacopoeial Committee of Revision. Physicians are not agreed on this subject, and the pharmacists would be glad to have some authoritative statement to guide them.

A neglected function of this committee is to collect statistics regarding the frequency with which official and semi-official remedies are used in legitimate practice. In this connection the chairman desires to call attention to the fact that our late lamented member, Professor Hallberg, began in June, 1908, to collect statistics on one million prescriptions under the direction of the Board of Trustees of the U. S. Pharmacopoeial Convention. Professor Hallberg succeeded in collecting the data from 117,000 prescriptions, and the report was

placed in the hands of the Pharmacopoeial Committee on Revision in Circular 100, January 14, 1911.

The report embraces 122 collections of nearly 1000 prescriptions each, and represents 57 cities and 28 states. It is most elaborate and full of valuable information. It is interesting to note in the summary that the 15 most frequently prescribed drugs per thousand prescriptions are the following:

1.	Nux Vomica and Strychnine	67
2.	Opium, Morphine and Codeine	64
3.	Digestive Ferments and Pepsin	56
4.	Quinine and Salts	40
5.	Calomel	36
6.	Sodium Bicarbonate	30
7.	Phenyl Salicylate (Salol)	29
8.	Phenacetin	23
9.	Bismuth Subnitrate	22
10.	Cascara Sagrada	22
11.	Potassium Iodide	19
12.	Sodium Salicylate	19
13.	Caffeine	17
14.	Arsenic	16
15.	Acetanilid	12.5

According to this summary, Morphine is less often prescribed than either Arsenic, Acetanilid or Caffeine. It is probable, however, that this showing is occasioned by a relatively less amount of the morphine administered being recorded in prescriptions.

THE MAN WILLING TO PAY.

But to the man who refuses to be a galley slave, who feels the hot blood surging through his veins, who has ambitions, who wants to grow and develop, mentally, morally and physically, who yearns for the things that money can't buy—friendship and love, and the laughter of children, who realizes that we are passing through this life but once, and should give and take all the happiness and pleasure we can—that he should live, fully and joyously, as we go along, even though it does cost a few dollars each year—to such a man, the man who is willing "to pay the price," life has a meaning all its very own, a meaning which is Stygian darkness to the man whose God is money, money, money, whose thought is work, work, work, and whose life, in its final analysis, is a sickening, saddening and lonely failure, whether he be poor or whether he be rolling in the wealth of a Croesus.—*J. W. England.*

Section on Practical Pharmacy and Dispensing

Papers Presented at the Fifty-Ninth Convention

NOTE ON DISTILLED WATER.

W. H. ALLEN, PH. G.

The process of producing distilled water of the U. S. P., if properly carried out, will produce an article answering all the requirements thereof.

In the conduct of certain other industries great quantities of condensed water are produced, and in at least one of them, namely, the artificial ice industry, the condensed water is collected. Owing to the pollution of water supplies there has sprung up a demand for sterile waters, and as a consequence we have both distilled water and distilled-water-ice on the market.

In some plants the steam, after having passed through the engines, is condensed, the cylinder oil carried over mechanically by the steam is separated, the water chilled and very carefully filtered, producing a perfectly transparent water. This product is sold as distilled water; it will answer the requirements of the U. S. P.

In one of the ice processes the above water is used and remains quiescent while being frozen in tanks, and any impurities in the waters are contained in the last portion frozen. Such ice is termed "can ice." In the center of the cake is a line showing any separated dissolved air, etc. This central portion at times contains ammonia; also, in some cases, oil. It is presumed that the oil was in pseudo solution in the water before freezing and during the process is separated out. It is very small in amount, but can be noticed by cutting out the core and permitting it to thaw out, when the oil will appear as an irridescent film.

The question arises: Are the requirements of the U. S. P. sufficient? The water mentioned above answers all the U. S. P. tests, yet it may contain oil, which can only be determined by freezing out the sample, when its presence or absence can be determined in the core or last portion frozen.

NOTES ON THREE U. S. P. FORMULAS.

THOMAS A. EGAN.

Elixir Aromaticum. This valuable and extensively used Elixir, made according to the U. S. P., with the following exceptions, will possess an elegant aroma.

Take of the oils the required amount to make compound spirit of orange, U. S. P., and dissolve them in the alcohol. Put this solution in a refrigerator

(the soda fountain may be used), and allow the solution to remain forty-eight hours. Remove the solution from the refrigerator and let stand at the temperature of the room for twelve hours. Now follow the official directions to completion.

This preparation, made in this way, retains its fine aroma for a longer time than when made by any other process I have tried.

Elixir Ferri, Quininae Et Strychninae Phosphatum. This valuable and extensively used elixir is best made according to the U. S. P. method, with the following exception:

The soluble ferric phosphate is put into a wide mouth bottle with 30 cc. distilled water and dissolved by agitation without the aid of heat.

Dissolve the alkaloids in alcohol and heat enough to slightly warm and add the phosphoric acid, when the alkaloids are immediately converted into phosphates without precipitation.

Add the acetic acid to the ammonium carbonate contained in a suitable vessel, and when solution is complete, do not neutralize, but leave slightly acid. Neutralization with ammonia deprives the elixir of its color, which should be a nearly "pea green." Complete according to the official formula.

I have made this elixir for several years by this process, and have a sample nearly two years old that is as perfect in color as when first made.

Syrup of Hydriodic Acid. The elements of hydriodic acid have such slight affinity for each other that the acid is quite readily decomposed. By replacing 4 fluidounces of syrup with an equal volume of glycerin a permanent preparation, free from irritation, will be obtained.

MORE WORKING FORMULAS FOR CHEMICALS U. S. P.

W. H. GLOVER.

The loss of some chemicals which do not keep well, and for which the call in many drug stores is limited, leads the writer to suggest that working formulas for small quantities, say 100 grams, be inserted in the Pharmacopoeia for certain chemical compounds, as, for example, Ammonium Iodide, Strontium Iodide, Zinc Iodide, Calcium Chloride, Calcium Bromide, and also that working formulas for 50% solutions of Phosphate of Iron, Citrate of Iron and Ammonium, and Citrate of Iron and Quinine be inserted. I believe many pharmacists would prepare these solutions who would not prepare the scale salts, and the convenience at the prescription counter I am sure would be appreciated, particularly in damp weather.

As transportation companies refuse to forward Pyroxylin, I would suggest that a working formula for this be added, and also formulas for Zinc Stearate, Potassium and Sodium Citrates, Ammonium Salicylate, Thymol Iodide, and Hydrogen Peroxide.

Section on Commercial Interests

Papers Presented at the Fifty-Ninth Convention

PHARMACEUTICAL WINDOW DISPLAYS.

OTTO RAUBENHEIMER.

Pharmacy makes the claim, and this very justly, in my opinion, of being a profession. But let us consider if the displays in the majority of our pharmacies and drug stores impart this impression to the public as well as to the medical profession.

We find, first of all, displays of nostrums and patent medicines guaranteed to cure all ailments. It is a well-known fact that many a patent medicine manufacturer has reaped his fortune through such free advertising of his remedy. Druggists and pharmacists should bear well in mind that by dispensing such patent medicines they stamp them with their personal approval and recommendation. That such displays are very frequently of the illicit kind, can be seen in the "make man tablets," "female regulator," in the "bust developer," etc., etc. Pictures of "before and after" tend to make such displays still more obnoxious.

Another window display which is often met, and which the writer considers a disgrace to pharmacy, is a certain malt whisky, recommended as "the highest type of medicine for consumption, grippe," etc. Displays of china and glassware, bric-a-brac, cutlery, and even of jewelry, even if profitable side lines, are entirely foreign to pharmacy and will never help to give physician or layman the necessary confidence which is needed in buying drugs and for the compounding of prescriptions.

One of the strangest displays which the writer has ever noticed was canary birds, at a reduced price, in a Nassau street drug store in New York City. Not only are fountain syringes, together with their fittings, openly displayed in some drug store windows, but also that "marvelous spray syringe," that "female friend," which ought to be in the house and hands of every woman, married or single, together with full directions and explicit illustrations. But the climax in pharmaceutical (?) window displays was undoubtedly reached in the one which the writed noticed in the Quaker City, not very far from the oldest college of pharmacy, namely, a very large window full of suspensory bandages, reduced to 2 for 25 cents.

I can not close my introductory remarks without mentioning the very ethical and esthetical window display so frequently met, that is, toilet paper in rolls and packages. Very suggestive, indeed.

How can we expect to impress the laity and the physicians that pharmacy is a profession with such window displays?

The stock of even the average drug store is of such variety that pharmaceutical

window displays can be made which are a credit to the profession and which, at the same time, are profitable to the pharmacist.

Goods which should not be displayed in show windows. The education of the pharmacist should most certainly have taught him that light, and especially direct sunlight, has a bleaching or reducing action upon most substances. But judging from the window display of hydrogen peroxide, olive oil, perfumery, etc., etc., the knowledge of the men who make these displays seems to be very limited.

Such displays can be seen daily. Imagine the rays of the sun striking "peroxide" for an entire week! Imagine olive oil, which the producer in Italy or France has most carefully manufactured and put up in sealed bottles, now treated in such a manner in the U. S.! Imagine delicate and expensive perfumes, which have been skillfully compounded, blended and aged in cool and dark rooms, now exposed to the direct rays of the sun! Among other goods which should not be displayed in exposed show windows I might mention Malt Extract, which barely contains enough alcohol to preserve it in a cool place, and also rubber articles, which, upon exposure, become hard and brittle, or, as ordinarily expressed, "lose their life" and thus become unsalable.

The resources of the pharmacist who is somewhat ingenious and practical are very numerous.

Filtration. This simple process can be made quite an attraction if carried on in the show window. Water colored blue, with a little ultramarine, can be filtered clear and is a strange phenomenon to the average person. And still more so is the decoloration of water tinted with an aniline dye and filtered through kaolin.

Continuous Filtration, or one lasting quite a long time, can be easily arranged by an inverted large, f. i. 5 gallon bottle over a large filter. To prevent any splashing, the bottle should be fitted with a stopper and one or two pieces of glass tubing.

Percolation, especially if a bottle containing the colorless menstruum is inverted over the percolator, has proven quite an attraction in my window, and the highly colored percolate, dropping at regular intervals, arouses the curiosity of the public.

Distillation. The process carried on in the show window will give that pharmacy a professional and scientific look. A Remington still can be used for the distillation of water, and also for the recovery of alcohol from the marc left after percolation. If a glass retort is used, the difference between the colored liquid to be distilled and the colorless distillate will be a mystery to the average public.

The writer has found an upright or reflux condenser attached to a large flask quite an attraction. This method of distillation has the great advantage of taking care of itself without any constant watching.

Precipitation: This process can be utilized in the manufacture of milk of magnesia by filtering the solution of magnesium sulphate into the solution of sodium hydroxide contained in a large and tall bottle. The magnesium solution being heavier in gravity sinks to the bottom, forming magnesium hydroxide on its way.

Washing, Decanting and Siphoning can be demonstrated in the manufacture of the same preparation.

Laboratory Ware displayed in the show window is one of the best attractions.

The variety is so large that there is no trouble to select from. I will mention the following: funnels and percolators displayed on stands, percolator jars, tincture press, drug mill and sieves, water bath and evaporating dishes of glass and porcelain, precipitating jar and stirring rods, etc.

Chemical Glassware makes a still more scientific display, a display which gives the public the impression that this pharmacist belongs to another, i. e., to a higher class. The following can be displayed to great advantage: retorts, condenser and receiver, different styles of flasks, including volumetric flasks, pipettes, and burettes with stand, wash bottle and drying jar, beakers and test tubes in rack, hydrometers in jar, specific gravity bottle and even blowpipe.

Prescription Utensils constitute a very appropriate window display, which will impress the laity and also the medical profession and will thus help to increase the prescription business. The following might be displayed: different sizes of mortars and pestles of wedgewood, porcelain and glass, graduates holding from minims to a quart, even a prescription balance, pill machine, porcelain tile, tablet and tablet triturate machines, suppository machine and moulds, infusion jar, spatulas, an assortment of pill and powder boxes, different sizes of ointment and other jars and a row of prescription bottles, holding from one drachm up to a pint or quart.

Prescription books and files, especially if you have an old established pharmacy, always make an interesting window display. At the same time a sign might state the number of prescriptions compounded during a month or year, or during the entire existence of the store. While on the subject of books I will also mention a

Literary Display, as f. i., some of the Pharmaceutical Journals, which you read or some of the Books on Pharmacy, Chemistry, Botany, Materia Medica, etc., or some of the Pharmacopoeias and Formularies in your library.

Such a display, quite especially if it includes some foreign journals and books, will undoubtedly raise you in the opinion of the public above the level of the ordinary druggist. Along the same line, it is well to occasionally make a window display of your college diplomas, your licenses and your certificates of membership in different pharmaceutical associations. An odd display of that sort will interest the public and will benefit your business without any doubt. One of the most interesting displays is one of living plants in the show window.

It is not necessary to be an expert botanist to go out in the fields, or even in the city limits to gather a great many medicinal plants. The writer has done so on numerous occasions and might mention the display of digitalis in bloom, together with historical facts, from its introduction into medicine as a diuretic by the English physician, Withering, up to the discovery of its glucosides and the application of biological standardization.

A blooming larkspur plant, *Delphinium Consolida,* with its blue dolphin shaped flowers (wherefore its name), has proved quite an attraction and besides that has greatly helped the sale of tincture of larkspur.

Conium, the poison or spotted hemlock, with a bit of its history, as having been used by the Greeks to execute their criminals, and as being the plant from which the drink was prepared to poison Socrates, has proven an interesting window display. A jar of poisonous conium seed next to a jar of harmless anise seed together with a proper explanation of the danger of confusion, will have the bene-

ficial effect of inducing the laity to patronize the educated pharmacist in whom they have confidence.

Drug Display: Above all a druggist or pharmacist should occasionally make a display of drugs, including drugs in their crude state, in his show windows. Flowers, herbs, barks, roots, seeds, etc., displayed in boxes and jars, and of course properly labeled, make an interesting as well as an educational window display. If neatly written or printed signs, and a bit of history accompany this display, it will arouse still more attention.

I might also call your attention to the fact that at least one pharmaceutical manufacturing house in connection with its assayed preparations has placed in the hands of the pharmacist a set of drugs in glass stoppered bottles, with neat celluloid labels giving synonyms, definition, habitat, history, etc.

Besides window displays of vanilla beans in jars, of rhubarb in the root or in fingers, cubes and powder, of boxes of chamomile flowers, of tins of insect powder, of bars and pieces of castile soap, sticks of extract of licorice. The writer, during the Hudson-Fulton celebration in New York City (August 25-October 3, 1909) made a cinchona window display which was also exhibited at the October pharmaceutical meeting of the Philadelphia College of Pharmacy. This pharmaceutical window display is described in the American Journal of Pharmacy of November, 1909, p. 534-536, and was even abstracted in the "Mitteillungen zur Geschichte der Medizin und der Naturwissenchaften," Bd. IX, Heft. 3, p. 325, published by Leopold Voss, Hamburg.

The writer could continue to enumerate displays of chemicals and of various preparations, of specialties and of seasonable articles, but too much time has already been occupied.

Before closing, however, I want to call your attention to two facts, namely:

1. *Historical Information* as to the origin of drugs, the etymology of their names and their history is of great benefit in the practice of pharmacy and also in pharmaceutical window displays. Such a simple display as of sulphur, rochelle salt and cream of tartar lozenges can be made highly interesting and educational by displaying at the same time jars of these chemicals together with placards of their history.

2. *Dollars and Cents in Window Displays:* From a pecuniary standpoint these displays should also be profitable. In this age of commercialism even the pharmaceutical window displays have to produce hard cash. That such can be done I have fully demonstrated to my own satisfaction. The display just mentioned of sulphur, rochelle salt and cream of tartar lozenges greatly interested the laity, who willingly and rapidly bought these at 10 cents per box, while my nearest competitor offered sulphur and cream of tartar lozenges at 5 cents a box.

Through the display of chemical glassware the students of the high school bought their flasks, glass and rubber tubing and also chemicals at my store and also remembered me when their families were in need of any drugs, prescriptions, etc.

The display of the flowering larkspur plant, together with jars of the whole and ground seed and the finished tincture, has greatly helped the sale of the drug as well as the preparation. A neat show card in your window announcing th

you keep a complete line of chemicals and reagents will bring to your store students, amateur and professional photographers and physicians for their supplies and other goods.

Conclusion: The subject of window displays is most certainly an important one. In fact one of our bright pharmaceutical editors has even written a book, "Window Displays for Druggists," of which two editions have so far been published.

I trust that my suggestions for pharmaceutical window displays will be somewhat considered and will have the desired effect, namely, that more displays will be made pertaining to pharmacy, displays which will gain the confidence of the public and the physicians, and which will be a credit to the profession of pharmacy.

DISCUSSION.

MR. FORD: "It is refreshing to hear of the many things that we can put in our windows. I think about the nicest window display I have seen is the one represented in the hall outside, consisting of native medicinal plants. Especially effective as window ornaments are drug plants, concerning which the public has more or less information, as the Conium plant with which Socrates destroyed his ife, or the Henbane plant, the juice of which was injected into the ear of Hamlet's father. A good window display can also be made from U. S. P. and N. F. preparations. We had one at Denver a while ago consisting of the best looking preparations put up in good style in gallon bottles. Such a display commands the attention of both physicians and the laity.

"Anything which has life or possesses motion is effective as a window display, such as revolving mechanical devices, etc.

"I have had a good many window displays along the lines indicated by Mr. Raubenheimer. One of the most effective consisted of the slow dropping of a potassium iodide solution into a solution of mercuric chloride. Each drop as it strikes the chloride solution becomes pink, then red, and falls to the bottom in a red layer, leaving a colorless solution above."

SIMPLIFIED METHODS OF RECORDING CHARGE SALES.

AMBROSE HUNSBERGER.

This brief communication is offered without pretense of embodying entirely new suggestions, or of outlining hitherto unknown methods of handling the problem of charge sales, but rather with the idea that its presentation might encourage an interchange of individual views and experiences from which a "composite" impression could be made which would more nearly present the ideal method of entering charge sales unfailingly, quickly and accurately.

Two classes of stores may be eliminated as having no vital interest in this topic: the one class being made up of the very small drug stores having few or no charge transactions, while the other embraces the very large stores—more or less of the "department" type—in which systematic records of both cash and credit sales are conveniently taken care of by assistants, whose duties and qualifications are purely clerical.

The class which is most vitally concerned in this problem consists of what might be termed the average drug stores, and includes approximately eighty per cent of the establishments devoted to the practice of retail pharmacy.

In this latter class of stores the duties devolving upon the assistants are necessarily diversified in character, partly because of the variety of lines handled and partly on account of the long business hours, which necessitate working in "shifts" and requires a constant rearrangement of the duties to be performed. This rearrangement of duties brings about a certain amount of divided responsibility because of the resulting uncompleted transactions, and it soon develops the tendency among the members of an establishment to depend upon "the other fellow" to complete the charge sale, with the inevitable result that no one attends to this important part of the transaction. This point is well illustrated by the old phrase which tells us that "that which is everybody's business is nobody's business."

There is little trouble, of course, with credit sales which are handled individually and completely, and in close proximity to the daily charge sheet, or the cash register, where but a step and a few pencil strokes are necessary to complete the record. The trouble arises when you are out front, remote from register or charge-pad, possibly serving a charge customer, when your busy modern American citizen comes flying in through the door and breathlessly requests a dollar roll of adhesive plaster, which you courteously hand to him from a nearby shelf, and he disappears as rapidly as he came with the injunction to "charge it." You are about to make a note of the transaction, but are met at the half-way point by a junior assistant with a request for information regarding a rush order which he is packing up, and after disposing of him you apologetically return to your waiting customer, having decided to enter up the adhesive plaster sale along with the charge sale before you. When finally the uninterrupted sequence of drug store events has enabled you to get in touch with your charging system you have probably lost all recollection of the man in a hurry for a roll of adhesive plaster.

While such occurrences are not the rule, yet there are a sufficient number during a year's work in a reasonably busy store to warrant the assumption that the net profits would be increased materially by their total elimination.

It is probably true that in many stores the active proprietor is the chief culprit. His desire to avoid the appearance of unnecessarily detaining a charge customer occasionally prompts him to allow the purchaser of numerous articles to depart before making a complete record and in entering the charge subsequently important items are overlooked, or with proper gallantry he escorts Mrs. Jones to the door, only to meet Mrs. Brown coming in with an order requiring immediate attention, and the first transaction is forgotten, or perhaps only in part recalled to memory. Another illustration is that of your friend, the doctor, with whom you discuss at length a topic you've had in mind for some time and when he finally departs you have probably managed to overlook the fact that the doctor bought a two dollar hypodermic syringe on credit just before you began to unlimber your eloquence.

The proper control of packages sent out by messenger, express or post also presents some difficulties, particularly in stores where the amount of this business falls just below the volume that would warrant the organization of a department having this work in charge.

Taking into consideration, then, that in the average drug store the organization of departments, properly manned, and built out from a common center (cashier or bookkeeper) is precluded because of the kaleidoscopic character of the trans-

actions requiring trained assistants with shifting hours of duty, it will be seen that the establishing of a system of properly controlling credit sales is no simple problem, and if not given the deserved consideration may seriously menace the success of a business.

The successful operation of methods of control must involve anticipation of the cooperation of our patrons. It is a generally accepted fact that the same patron who cheerfully passes twenty minutes in a department store awaiting completion of a transaction involving the purchase of a paper of pins will turn a drug store inside out if detained over ten minutes by the preparation of a prescription which may involve the handling of violent poisons and require the utmost skill in the manipulation. And how does he explain his calm attitude toward the pin transaction—"Oh, that's their system. You couldn't run a department store without a system." A logical conclusion, of course, but did his own sense of reasoning lead him to it? Why, no, the department store simply established the system, enforced it, and the pin customer is so well used to it that he almost deludes himself with the idea that it was his own suggestion. And why does he fail to recognize the need for system in the drug store, of all places? Probably because his experience has taught him to believe that the department store would rather lose the sale than fail to enter the charge, while the druggist would rather fail to enter the charge than lose the sale.

It must be understood that this attitude is not assumed by the great majority of our charge customers, but applies to isolated cases such as any of you can probably call to mind; and it is those cases that we are dealing with—it is usually the isolated, the odd, the unexpected credit transaction that we forget to record. Impatience with our system on the part of the patron must be overcome by a judicious display of tact and diplomacy, the needs of our patrons must be supplied courteously, intelligently, and with dispatch, and then without undue delay or ostentation, but with firm insistence for a complete record of charge purchases.

While perhaps not the best method extant the scheme of carrying paper pads has been found to work fairly well. An important part of this system is involved in carrying the pad in one's pocket—a promiscuous distribution of pads about the establishment and a wild scramble for one when an entry is to be made is neither dignified nor helpful. They should be distributed among the members and their invariable use for the purposes indicated insisted upon. The fair success of this method may be attributed to the fact that it places the facilities for recording credit transactions immediately under one's hand at all times, and may be adapted to cover only the remote parts of an establishment, or to include all transactions within the place of business. The ultimate disposition of the slips is governed by the next step in the credit system—the bookkeeping. If it be desirable to preserve the original entries the slips may be placed in envelopes properly dated, and filed away.

The use of blank sheets in these pads is not desirable, for several reasons, the chief ones being the lack of symmetry in the placing of names and items, which makes the work of transferring more difficult; the more impressive appearance of a printed sheet in the eyes of the patron; and the further fact that a little ingenuity exercised in wording the printing makes the sheet do double and even triple duty, in that it may be made to serve as an emergency order blank, a charge slip,

and an identity slip that stays with the prescription until its final delivery to the proper party. The wording on such a sheet would include blank spaces for name, address and date; method of delivery is indicated by a pencil-tick following the abbreviations "Mess.," "Post," "Ex.," "Call." Charges are indicated likewise after "C. O. D. Chg. Pd.," and the identity of all concerned in the transaction is indicated by "Ord' by..... R'c'd by..... Del'd by..... The time to be delivered is stated after "When".....

When this slip is used to enter a charge it is filled out in the usual manner, "Chg." is ticked and "del'd" placed after "When." If used for the other purposes indicated it goes through the usual routine, after which it is placed on the charge file or filed with "Orders filled." It can also be made to serve the purpose of a charge against the messenger who takes C. O. D. deliveries. If desirable these may of course be used in duplicate with the aid of carbon paper.

The commendable points of this method are its simplicity, accuracy, but it won't do to say it's infallibility, because just at that point the personal equation steps in. However, this communication may bring out the infallible method, since the spirit of scientific management is in the air, and there is no one more deserving of discovering that method nor better entitled to its use than the retail pharmacist.

DISCUSSION.

MR. GUILFORD: "These talks on bookkeeping and proper management of drug stores have certainly appealed to me. I conduct two large stores and they have been made successful through system, through bookkeeping and strict accounting for cash received. I have in my two stores the best cash system that I have seen in any drug store and I have been in a great many. I especially believe in system and think it is impossible for a man to succeed in business without system. He must know what his profits are, and these can be ascertained only through a thorough system of bookkeeping."

MR. DAVID STOLZ: "I came here to learn something and have gotten hold of some good things, especially the "credit system" of the paper just read. At our store there is a large amount of telephone business, and consequently a number of charge accounts. We have one of those machines in which there are three rolls of paper. The top one is the original, which we put into the customer's package; the blue one we give to the delivery boy, and it is signed by the customer when the package is delivered. It always bears the name of the party, and at the end of the month if the customer claims he did not receive the order the matter can be traced. If there is nobody at home, the boy writes on the slip, "Left at the front door or rear door," etc. If the package is sent by special messenger, it is indicated what messenger service delivered it.

"Regarding Mr. Cook's paper, which I enjoyed very much. He gave a lot of different items under which things should be charged in the store accounts. That looks very good, but where you have a store and employ a bookkeeper and have many large charge accounts to your customers your bookkeeper has all she can do to itemize these accounts. I do not see why you should have so many accounts, as Freight, Drayage, Clerk Hire, expense of this and expense of that all under different items."

MR. HYNSON: "It is simply a question of information. If you do not want that information, don't keep these accounts. The whole idea of keeping accounts is to see how much you are spending for freight or one thing or another, and to give you information about your business."

Section on Historical Pharmacy

Papers Presented at the Fifty-Ninth Convention

PRODUCTS OF THE ISLAND OF SOCOTRA.

ADOLPH W. MILLER, M. D., PH. D.

The Island of Socotra, situated in the Indian Ocean, 543 miles distant from Aden and 120 miles east of Cape Guardafui, has been regarded as the source of Socotrine Aloes by the earliest writers on medicine, as well as by later authors. Although the island is in the direct steamer route from Aden to Colombo, it is almost isolated at present, principally owing to the absence of protected harbors. During the monsoon season vessels are compelled to give Socotra a wide berth. Even in the mildest weather, ships of larger size than the native Arab dhow are compelled to anchor some miles from shore.

Among the ancients, Socotra was known as the Island of Dioscorides, who appears to have been well acquainted with the virtues of aloes. Both this and the modern name are usually traced back to a Sanskrit form Duipa-Sakhadhara, meaning the Island Abode of Bliss.

Cosmas, a traveller of the sixth century, says that the people of Socotra spoke Greek and that they were largely Christian, having a Bishop from Persia.

The famous Arab traveller and geographer of the twelfth century, Idrisi Abu Abdallah Muhammed, al Sherif Al Idrisi, better known simply as El Edrisi, relates the following curious tradition, which was current in Eastern countries as early as the fourth century: When Alexander the Great had conquered Persia, India and the adjoining islands, his tutor Aristotle, the former apothecary of Athens, advised him to seek the island that produced aloes. Therefore, when he had been sated with his conquests in India, he set sail for Socotra, the climate and fertility of which he admired. Following the advice of Aristotle, he removed the original inhabitants and put Greeks in their place, enjoining the latter to preserve carefully the plant yielding aloes, on account of its utility and the necessity of employing it as an ingredient in certain sovereign remedies. The colony of Ionian Greeks, which he established, remained under his protection and that of his successors, acquiring great riches in course of time.

When the religion of the Messiah appeared, they embraced and retained the Christian faith up to the time of Edrisi's visit in 1154. The Socotrans remained Nestorian Christians throughout the Middle Ages, but they have gradually lost all traces of Christianity except a reverence for the cross. They now practice South Arabian moon worship.

As no Greek or Roman writer confirms Edrisi's story, it is probably merely a fable invented to account for certain facts. Still it is somewhat strange that

Mohammedan voyagers of the ninth century repeat the same legend. Masudi, of the tenth century, says that aloes was produced then only in Socotra by Greeks, who had been sent there by Alexander the Great, and who had improved on the original methods of the natives.

The Journ. de la Soc. Pharm. Lusit. of 1838 contains a letter addressed in 1516 by Thome Pyres, an apothecary of Cochin to Manuel, King of Portgual, in which it is stated that the most highly esteemed aloes is grown in the Island of Cacotora.

The records of the East India Company, in the early part of the seventeenth century, contain many notices of aloes being bought of the King of Socotra. Wellstead, who visited Socotra in 1833 says that the cultivation of aloes had then declined, but that the walls which had enclosed the old plantations were still to be seen. At that time, the production of the drug was a monopoly of the Sultan.

Dr. Kirk, when residing in Zanzibar from 1866 to 1873, noted that then aloes from Socotra arrived there in a very soft state, contained in goat skins. After being transferred to wooden boxes and having solidified, it was shipped to European markets.

An interesting and valuable report on the Island of Socotra has been furnished to the government by Chas. K. Moser, United States Consul at Aden, Arabia. He states that the island is about 73 miles in length and 36 miles wide at the widest part, and that the population is now estimated at 13,000. It is very mountainous, the Haghier range rising from 2000 to nearly 5000 feet, and forming the core of the island. Although very rocky, the whole island is exceedingly fertile. Many strange forms of flora are found on the mountain slopes, chief among these being *Dendrosicyos socotrana,* or cucumber tree; *Dracaena cinnabari,* or dragon's blood tree in several varieties; adeniums; euphorbias and three species of the frankincense tree (*Boswellia ameero, B. elongata* and *B. socotrana*). All of these trees have immense swollen limbs, suggestive of vegetable elephantiasis. By means of this peculiarity, these plants have adapted themselves to subsist on an extremely dry soil.

Rain rarely falls in the Haghier range except during the months from May to September, when the streams become torrents and the soil is then completely saturated. Most of these trees are resin bearing. They exude a thick milky substance, which would have a commercial value were it to be obtained in a less isolated locality.

In ancient times, Socotra was famed for frankincense, myrrh, dragon's blood and spices. Now Socotra produces more dragon's blood. Myrrh and frankincense are more easily procured and of better quality from Somaliland and other localities. The Socotran does not take the trouble to collect the products from the wild trees that abound. A little dragon's blood is usually used as a dye, and a small quantity of frankincense is shipped to Aden. The principal item of export is ghee, a butter made from goat's milk, which is highly prized by the Arabs. The natives call the resin of the frankincense tree luban, which is the proper Arabic name for it, derived from ""Lbnan." This is the Arabic name for Mount Lebanon, which is so called from the milky whiteness of its perpetual snow. This same term is found in the Hebrew and in the Greek *libanos,* as well as in our Latin

term Olibanum, which is simply the result of joining the Arabic article "al" with the root luban.

The frankincense of Socotra is inferior in quality to that produced in the Hadramaut and Somaliland, and the island trees secrete a smaller quantity of the resin. The average yield per tree in Socotra is about two pounds each year. Its value is whatever amount of rice, ghee, cotton goods or kerosene oil the collector can persuade the Arab trader to give for it.

The ruby-red exudation of the dragon's blood tree is valued among Orientals as a dye. The Socotrans call the tree A'aree-ib and the dragon's blood resin Mu'soi'lo. Like the incense, these trees stand in thousands on the Haghier hills, and a large source of revenue could be obtained from their milky juices. Fifteen fraselas, or about 48 pounds of dragon's blood is considered to be worth five goats, which the Arab trader will value at ten Maria Theresa dollars, or about $4.46. According to this somewhat complicated calculation, the dragon's blood is worth about 10 cents per pound.

The finest kind of frankincense or al-luban offered in the Aden market is used as incense in the Latin churches and in the richest Mohammedan mosques of the East, where it is called "luban dakkar." The price of the best kind varies from $11.50 to $18.00 per bokkar, consisting of three baskets, each containing one hundredweight. The second quality of a clear, transparent, nearly white color is exported only to Cairo, where it is in great demand, as the Arabs use it as a chewing gum for the prevention of thirst. Its price varies from $1.00 to $4.00 per maund of 32 pounds.. It is called "luban haali," meaning sweet incense.

The third quality is of dark brownish color and is used by the poorer classes as an incense and as a fumigant for driving away mosquitoes and other insects. The merchants pay from 16 to 33 cents per maund of 32 pounds for this grade.

The natives of the interior grow small patches of dhoorra, tobacco and cotton. Their principal occupation is the raising of sheep, goats, asses and camels, and a very fine breed of humpless cattle, quite distinct from those met with in Asia and Africa.

Civet cats are occasionally caught and the civet obtained from them is used locally. Wild asses in thousands roam through some parts of the island. Frequently the young are caught by the Bedouins and trained to domestic uses.

The Socotran cow is the most beautiful and important of the native animals. She is without the hump, which characterizes Indian cattle. Even in the dryest season, she always presents a sleek, well nourished appearance. Her milk is rich in butter fats; two and three gallons per day is a frequent yield of the choice cows. The Socotran cows are fawn color, and in general appearance they are much like the Alderney. As they appear to be the ideal dairy animals for hot, dry countries, the Indian government is endeavoring to introduce them into India.

It is to be noted that in the above account no mention is made of any Socotran aloes being at present produced and exported from that island. Most probably that which is now sold under the name of Socotrine aloes is all obtained from Zanzibar, Moka and other countries.

The 1908 edition of Brockhaus' Konversations Lexikon makes the positive assertion that at present no aloes whatever is obtained in Socotra.

It is therefore an open question as to whether those who still dispense and sell Socotrine aloes are not in conflict with the rigid provisions of the Pure Food and Durg Law of 1906.

Even if it could be established that a certain lot of aloes was actually the product of the *Aloe socotrina,* Lumarck, this would not entitle the drug to be sold as Socotrine aloes, as the *Aloe socotrina* was shown by Bolus to be indigenous to the Cape of Good Hope, while the true Socotrine aloes was formerly obtained from the *Aloe Perryi* of J. G. Baker, and a dwarf species with spotted leaves.

BUSINESS CREDIT AND FIRE INSURANCE.

Practically all business in the United States is done upon credit, and the accurate placing of a man's rating is one of the carefully studied commercial sciences of the day. That merchant is foolish who does not give the information requested by creditors or by commercial agencies, and who does not comply with all of the requirements of the situation. Insurance protection plays a large part in the problem of credit, and every merchant owes it to his creditors as well as to himself to see that he buys fire insurance of the proper kind and quantity. So important is this consideration that the National Credit Men's Association, during the last two or three years, has published no fewer than six booklets on the relation of insurance to credit. And yet every day merchants are being burned out with little or no insurance, thus subjecting themselves and all their creditors to losses for which there is no excuse at all.—*Bulletin of Pharmacy.*

CLAMS AND CALAMITY.

A cooped-up, imprisoned, bilious druggist, can neither be a good husband, father or citizen, and it is your plain sacred duty to yourself, your family and your state to help in the regeneration of pharmacy. Don't be a clam—don't breathe calamity —get up and out, and emancipate yourself. Don't sit in your store, studying the race cards or devouring yellow literature; read your drug journals, see what others are doing, and tell others what you are doing; help the editors, poor fellows, to make their columns good lively reading, and you will help others as well as yourself.—*W. Bodemann.*

Reports of A. Ph. A. Committees

Abstracts from the Report on the Progress of Pharmacy for the year 1912, by C. Lewis Diehl, Reporter.

(Second Installment.)

Fehling's Solution: Evolution of the Original (Empirical) to the Present-day (Exact) Composition.—O. Lüning contributes the results of an inquiry into the gradual evolution of the originally simple, though empirical formula given by Fehling (1848), to that modernly insisted on, which requires great exactitude in the quantities of copper sulphate (34.639 gm.) and of sodium hydroxide (51.6 gm.) to the liter. By his original formula, Fehling simply endeavored to produce a stable solution, without reflecting upon the possible use of the reagent for the quantitative determination of glucose; he directed that 40 gm. pure crystallized cupric sulphate be dissolved in approximately 160 gm. water, and to the cold solution the addition of 160 gm. potassium tartrate in 500 gm. caustic soda solution, sp. gr. 1.12 and sufficient water to make 1 liter at 15° C. But subsequently (1849), believing that 1 Mol. of sugar corresponds to 10 Mols. of cupric sulphate, he recommended the further addition of water so as to produce 1154.4 cc. of the reagent, which possessed this relation to the sugar, and this soon led to the reduction of the cupric sulphate to 34.639 gm. in the formula producing the original volume of 1 liter. The author then interestingly describes the further evolution until the present formula, used almost universally, was adopted, this consisting, as is well known, of two solutions, to be mixed in equal volumes as required, viz.: No. 1, 34.639 gm. Cupric Sulphate dissolved in water to make 500 cc.; No. 2, 51.6 NaOH (in 100 cc. Water) and 173.0 gm. Rochelle Salt in sufficient water to make 500 cc. The author proves from the literature that the insistence on the fractions of copper sulphate and NaOH is not necessary. The quantities may be rounded off to 34 and 51 gm. respectively, and this should be done in the published formulas for this solution.—Apoth. Ztg., XXVII (1912), No. 10, 91-92.

Fern Rhizomes: Anthelmintic Value of Various Sorts.—In view of the statement that the ethereal extract of *Dryopteris dilatata* is at least four times as active as the corresponding extract of the official *Aspidium filix-mas rhizome,* and has therefore been suggested to replace male fern in the various pharmacopœias, H. Rosendahl has examined a number of anthelmintic fern rhizomes, his results confirming the inferiority of *Dryopteris dilatata.* The yield of ethereal extract is about the same (10%); but while it takes from 8-10 gm. of oleo-resin of Aspidium to drive off the *Bothricephalus latus,* it requires only 2 gm. of the oleo-resin prepared from the rhizome of *Dryopteris dilatata,* or 4 gm. of that from *D. dilatata* var. *spinlosa*—the latter yielding however as much as 17% of oleo-resin. The rhizomes of other ferns yielded very small percentage of oleo-resin: *Filicis aquilini,* 20%; *Filicis feminae,* 0.9%; *Filicis alpestris,* 0.7%. Under the microscope these extracts exhibit various crystalline structures which serve well for their identification.—Apoth. Ztg., XXVI (1911), No. 27, 217; from Svensk. Farmaceutist Tidskrift, 1911, No. 5, 85-89.

Ferrous Salts: Dimethylglyoxim a Sensitive Reagent for Ferrous Salts.—If to a drop of the solution of a ferrous salt a little tartaric acid is added, followed by about 1 cc. of alcoholic solution of dimethylglyoxim and the mixture is then supersaturated with ammonia, an immediate intense red coloration results, resembling that produced by rosolic acid with alkalies. The reaction is more sensitive than any of the known ferrous reactions, but is not so stable on exposure to air, because the ferrous compound is slowly converted into the ferric state and the color disappears when this conversion is complete. It reappears, however, on the addition of a reducing agent, such for example as stannous chloride, metallic zinc, etc. The reagent is not suitable for the determination of small traces of ferrous salts, either by themselves or in admixture with ferric salts, since by the supersaturation of the acid fluid with ammonia considerable heat is developed, resulting in the

rapid conversion of the ferrous to ferric oxide, which does not give the reaction.—Pharm. Ztg., LVII (1912), No. 13, 126; from Chem. Ztg., 1912, No. 6.

Fixed Oils and Fats: Improved Method of Determining the Iodine Number.—G. O. Gaebel has used with advantage the potassium bromide-bromate solution, directed in the G. P. V. for phenol determinations, for the determination of the iodine number in fats and oils. The bromate solution is prepared by dissolving 1/60 Mol. of potassium bromate and 5/60 Mol. of potassium bromide in sufficient water to make 1 liter, and the determination of the iodine number is carried out with this as follows:

The usual quantity of fat or oil is weighed into a glass-stoppered flask of about 400 cc. and dissolved in 10 cc. of carbon tetrachloride; 50 cc. of the bromide-bromate solution are added, mixed by rotating in the flask, and the mixture is strongly acidulated with 30 cc. of diluted sulphuric acid (1:5). The flask is then securely closed with the slightly parafined glass stopper, vigorously shaken once or twice, and then set aside at the room temperature protected from light. After permitting time for the complete reaction, the absorbed bromine is determined by carefully raising the stopper, adding about 1 gm. potassium iodide dissolved in a little water, then shaking vigorously and, after a few minutes, adding about 50 cc. of water, using this for rinsing the stopper and upper part of the neck of the flask. Finally the iodine liberated by the excess of bromate used is titrated in the usual manner with 1/10 N-thiosulphate, using starch paste as indicator. A blank experiment is made with 50 c.c. of the bromide-bromate solution, and from the data so obtained the iodine number is readily ascertained by calculation (1 cc. 1/10 N, $Na_2S_2O_3$=1 cc. 1/10 N—Br. =1 cc. 1/10 N—I=0.012692 gm. iodine). The results correspond quite accurately with the Hübl numbers given in the G. P. V.—Arch. d. Pharm., 250 (1912), No. 1.

Fluidextracts: Methods of Valuation.—Dr. E. Amort and Dr. W. Rothe, staff-apothecaries of the German War-Department, commendably discuss the progress that has been made in the methods of valuation of medicaments in general, but find that the proposed methods for the valuation of galenical preparations, such as fluidextracts and tinctures, are as yet deficient and lacking in exactness, being in many instances confined to determinations of specific gravity and residue of evaporation. The authors have subjected a number of fluidextracts to examination and make a detailed report of their observations and results. In a series of six purchased samples of fluidextracts of condurango they obtained in four of them figures which varied materially from those obtained with a fluid extract of their own preparation. They conclude from their results that the determination of specific gravity and dry residue of evaporation alone gives no criterion of quality, but that the shaking out process with suitable solvents, in conjunction with the determination of dry residue, affords a valuable criterion of quality and conscientious adherence to the prescribed process of preparation. To this should be added the determination of the tannin precipitate and of the nitrogen content of the fluidextract.—Pharm. Ztg., LVII (1912), No. 18, 175-176.

Formosa Opium: Characters.—K. Dieterich reports the results of a chemical examination of three authentic specimens of Formosa opium, received from Dr. Ishizu, the Japanese Commissioner having charge of the Japan Division of the International Hygienic Exhibiton. These opiums were, unlike the ordinary opiums, apparently obtained by a method of extraction, and therefore essentially extracts of opium, but inferior not alone to extracts obtained from the drug but to the opium itself. The three samples were identical in appearance, of a brown-black color, thick-liquid, extract-like, and in odor resembled the ordinary extract. Under the lens they were shown to be free from the plant-elements that characterize ordinary opium. Subjected to analysis by two of his chemists (Weinhagen and Mix) the results were as follows:

	No. 1	No. 2	No. 3
Moisture	24.37	20.68	25.96
Ash	3.58	3.74	2.55
Water Soluble substance dried at 100°	64.14	61.26	63.56
Morphine Content	5.27	7.55	5.71

The presence of meconic acid was determined in each of the samples.—Pharm. Zeutralh., LIII (1912), No. 5, 114.

Lactic Acid: Reactions.—C. Reichard has made comprehensive investigations of certain lactic acid reactions, and describes a number that are particularly characteristic, such, for example as those obtained with potassium dichromate, ammonium heptamolybdate, and potassium ferricyanide. The addition of a little pulverized potassium di-

chromate to a drop of lactic acid, produces gradually, over blue-green, a nickel-green coloration, while ammoniumheptamolybdate produces under the same conditions at first a sky-blue color, also gradually changing to nickel-green. A solution of potassium ferricyanide yields with lactic acid a characteristic yellow coloration.—Pharm. Zentralh., LIII (1912), No. 3, 51-56.

Lecithin: Question of Solubility in Water.—In view of the interest that has in recent years been manifested in medicine and pharmacy concerning lecithin and its preparations, resulting in the endeavor to present it for internal exhibition in form of solutions, wines ,and syrups, Dr. P. Salzmann has made a comprehensive inquiry to ascertain from the literature whether the assumption that lecithin from egg-yellow is soluble in water to form clear solutions is justified by the facts. According to the most recent researches, lecithin is a monaminophosphatid, containing for one atom of phosphorus one atom of nitrogen, and is composed of glycerophosphoric acid, cholin, and two fatty acids—probably stearic and palmitic or oleic. It is characterized by the latest writers (for example by Thierfelder) as presenting a plastic, wax-like mass, soluble in alcohol, ether, chlorform, carbon disulphade, benzol, and fixed oils, but simply swells up in water, forming a pasty mass which, when greatly diluted, forms a colloidal solution. It is therefore regarded by the author mentioned, and by others who have made comprehensive studies of the subject, as being an "organic colloid," capable of suspension in water so as to produce an apparent solution, but readily precipitated from such suspension by many substances, such as acids, metallic salts, etc., and even by alcohol, which by itself dissolves lecithin readily and completely. To meet a demand for water-soluble lecithin, such a preparation has recently been introduced under the name of "water-soluble egg-phosphatid." Examined by R. Cohn, this product was found to contain sodium chloride, glycerin, nitrogenous matter, glycerophosphoric acid and water, but not a trace of lecithin. This product is therefore in no sense a lecithin preparation, nor are the solutions, syrups and wines that are made from it.—Pharm. Ztg., LVII (1912), No. 14, 134.

Milk Sugar: Contamination with Bacteriae.—Experiments made by Dr. H. Kühl to determine the queries whether commercial milk sugar is contaminated with *bacteriae,* and if so, what is their nature, convince him that commercial milk sugar frequently does not respond to hygienic requirements, and that besides inorganic and nitrogenous impurities, as has already been pointed out by others, it also contains bacterial impurities which, in some cases, are of an exceedingly dangerous nature.—Pharm. Ztg., LVII (1912), No. 11, 105; from Südd. Apoth. Ztg., 1912, No. 1.

Paraldehyde: Estimation of Acidity and Acetaldehyde.—While the G. P. V. defines Paraldehyde to be a "clear, colorless liquid, containing about 4% of acetaldehyde," it gives tests which do not correspond with a paraldehyde containing 4% of acetaldehyde. Moreover, the pharmacopœia is silent regarding the acidity, although all paraldehydes have an acid reaction, which increases by age and has the effect of vitiating the test by consuming a portion of the liberated alkali before its titration with HCl. After a comprehensive study, E. Richter finds that paraldehyde should not contain more than 0.5% of acetaldehyde, since it is quite possible to obtain such paraldehyde on the market, as shown by the analytical results obtained with commercial samples. If, however, the G. P. persists in admitting paraldehyde containing as much as 4% of acetaldehyde, the tests should be carried out as follows:

Ten gm. of paraldehyde are dissolved in 100 cc. of water by agitation; 2 drops of phenolphthalin solution are added, followed by KOH solution, drop by drop, until the last drop produces a red color. For this purpose not more than 0.5 cc. of normal KOH solution should be required, indicating a maximum content of 0.3% of acetic acid (1 cc.. N—KOH solution=0.06003 gm. Acetic Acid). Now, 20 cc. of sodium sulphite solution (25 gm. of crystallized salt in 100 cc. of water) are added, and the mixture of 20 cc. of the same sodium sulphite solution is then ascertained, and deducted from the amount first obtained. The remainder should not exceed 9.1 cc. Normal HCl, indicating a maximum content of 4% of acetaldehyde; or not more than 1.15 cc. if the sample contains only 0.5% of acetaldehyde (1 cc. Normal HCl=0.044 gm. acetaldehyde). As the result of his experiments, the author feels justified in recommending the following pharmacopœial definition for a good paraldehyde: Sp. Gr., 0.998—1000; acidity, 0.3%; acetaldehyde, 0.5%; metaldehyde (not heretofore

considered), 0.1 to 0.2%.—Pharm. Ztg., LVII (1912), No. 13, 125.

Solomon's Seal: Proximate Examination of the Fruits.—Ernest A. Rayner reports the results of a proximate examination of the berries of Solomon's Seal (*Polygonatum biflorum*), picked at Saginaw, N. C., in the summer of 1910. These berries, when dried, resembled huckleberries in size and appearance. The outer husk is relatively small, the main part of the berry consisting of a cluster of about ten small, round, hard, and very tough seeds. The analysis showed them to contain: Sugars (glucose and a trace of fructose), 12.48%; Oil (mainly ricinolate), 2.00%; nitrogen, 1.88%; Ash ($SiO_2Fe_2O_3$, Al_2O_3, CaO, MgO, K_2O, Na_2O, P_2O_5, SO_3), 2.27%; other substances, cellular tissue, water, 81.37%.—Chem. News, June 21, 1912, 289-290.

Thorium: Separation and Estimation with Sebacic Acid.—While working upon the separation of thorium from the rare earths, T. O. Smith and C. James observed that sebacic acid gave a precipitate in a neutral solution which appeared to be quantitative. The thorium sebacate settles readily as a voluminous granular precipitate and is easily separated on the filter, while solutions of cerium, lanthanum, yttrium, etc., give no precipitate with sebacic acid even upon boiling. In order to test the availability of sebacic acid for the estimation of thorium, 50 cc. of a standardized solution (0.005572 gm. ThO_2 in 1 cc.) were heated in a 250 cc. flask to the boiling point, a slight excess of a hot solution of sebacic acid was slowly added, with continuous stirring, and the precipitate, which was formed at once, was immediately collected and washed on a filter with boiling water, then rapidly dried, ignited, and weighed as thorium dioxide. A series of experiments demonstraetd the accuracy of the method, and, furthermore, that the presence of other rare earths—cerium, lanthanum, praseodymum, neodymium, samarium, gadolinium, etc., did not vitiate the result. The thorium sebacate washes readily, and the operation may be performed with ease in a very short time.—Chem. News, March 8, 1912, 109.

Tincture of Iodine: Liability to Change and Expedients for Its Prevention.—Th. Budde, staff-apothecary in the German War Department, finds that under ordinary conditions there is a loss of iodine as such in the tincture of iodine of the G. P. amounting to as much as 20%, in the course of 9 months, resulting in the formation of hydrogen iodide, acetic ether and aldehyde. This change is particularly rapid during the first 8 days, but is materially retarded by the addition of 3.5 gm. of KI or NaI for 10 gm. of iodine. Nevertheless, the changes during 6 months are so great that a tincture should not be dispensed after it has been prepared that long. Moreover, it should be preserved in glass-stoppered bottles, contained in a tin can lined with asbestos on the inner side, the asbestos containing an iodine-combining substance. It has been a problem of the military sanitary authorities to devise means for supplying this tincture in a practically unchanged condition. This has been solved by supplying sealed vials, each containing 10 gm. of iodine and 3.5 gm. of potassium, 10 of such vials being enclosed in a card box. When the tincture is needed, the contents of a vial are dissolved in 90 gm. of alcohol, with instruction not to use the tincture so prepared after it is 6 months old.—Pharm. Ztg., LVII (1912), No. 18, 176.

Tungsten: New Assay Method.—B. M. Divani observes that when tungsten is in the condition of tungstate it is possible to precipitate and estimate the tungsten in the form of the trioxide—WO_3—all that is needed being to acidify the solution with HCl, HNO_3, or even H_2SO_4. But tungstic acid being slightly soluble in mineral acids, it is usually advised to render it insoluble by repeatedly evaporating (and resolution of) the acidulated solution and finally warming the dry residue for some time at 120° C. To avoid this tedious and time-consuming operation, the author now suggests for study a method based upon the precipitation of tungstic acid by an excess of a solution of freshly-prepared stannous chloride (50 gm. crystals per 200 cc.) which precipitates the tungsten in the form of the tungsten oxide—W_2O_5—the reaction being quite sensitive. In the experiment described by the author, 2 gm. of absolutely pure tungstic acid was dissolved in just enough concentrated ammonia water, and the solution diluted to 1 liter. To 50 cc. of this solution 20 cc. of the solution of stannous chloride is added, the mixture is boiled for a few minutes and the precipitate washed with *warm* water; then calcined and weighed. The floeculent precipitate settles rapidly in the water, so that the washing is quickly effected without loss. The results are quite accurate, as proven by a number of experiments described.—Chem. News, Feb. 2, 1912, 56; from Chem. Engineer, XIV, No. 24.

Turpentine Oils: Products of Oxidation

by Atmospheric Air.—American oil of turpentine, pinene from the same, Russian oil of turpentine, and sylvestrene prepared from the same, were subjected by C. T. Kingzett and R. C. Woodcock to the oxidizing effect of exposure to atmospheric air, in two series of experiments:

(1) By exposing the oils with an equal volume of water to a current of air at 65° C. for 24 hours, and then examining the aqueous solution.

(2) By exposing the oils previously dried over ignited calcium chloride, to a current of dry air at 65° to 69° C. during several weeks (when they showed the following specific gravities: Amer. turpentine oil, 0.931; pinene, 0.962; Russ. turpentine oil, 0.940; sylvestrene, 0.958), then shaking with half the volume of water, and examining the solution. The results were as follows:

First Experiment.

Yield of Oxidation products:

	Formic Acid	Acetic Acid
Amer. Oil	0.017%	0.038%
Pinene	0.14%	0.057%
Russ. Oil	0.026%	0.108%
Sylvestrene	0.16%	0.086%

	Formaldehyde	Acetaldehyde
Amer. Oil	Indications	None
Pinene	Indications	None
Russ. Oil	Indications	None
Sylvestrene	Indications	None

Second Experiment.

Yield of Oxidation products:

	Formic Acid	Acetic Acid
Amer. Oil	0.055%	0.024%
Pinene	0.054%	0.186%
Russ. Oil	0.13%	0.08%
Sylvestrene	0.059%	0.264%

	Formaldehyde	H_2O_2
Amer. Oil	None	0.71 vol.
Pinene	Indications	0.348 vol.
Russ. Oil	None	1.06 vol.
Sylvestrene	Indications	0.532 vol.

—Chem. News, Jan. 19, 1912, 26-27.

Water: Decomposition by Magnesium at Ordinary Temperature.—Arthur W. Knapp observes that when magnesium is mixed with water no reaction is observed at ordinary temperatures, although the formation of magnesium hydroxide and the liberation of hydrogen is an exothermic reaction. This is commonly explained by saying that the film of hydroxide first formed covers the metal and retards further action. The author finds, however, if magnesium powder be added to ten times its weight of water, and then to this mixture such an amount of palladious chloride as contains about one-hundredth part of the weight of magnesium used, a brisk evolution of hydrogen occurs. The temperature rises rapidly until the water boils and considerable white hydroxide is formed. The reaction is explained by the initial reduction of palladious chloride to metallic palladium, which acts as a catalytic agent. The small amount of magnesium chloride formed possibly also accelerates the reaction at first by dissolving the hydroxide; but the palladium, which has accelerated the *decomposition* of the water, soon accelerates its *formation*, for it is warm, and some of it rising on the bubble-films, which separate the hydrogen from the air, causes the hydrogen to ignite spontaneously.—Chem. News, May 31, 1912, 253.

Urine: Source of Error with Nylander's Test for Sugar.—Dr. E. Strauss has observed that certain substances interfere with the characteristic reaction for sugar by Nylander's test in the urine of diabetics (the production of a black color or precipitate by the reduction of the alkaline bismuth solution to metallic bismuth). Among these he finds iodthion, which when administered passes into the urine and is liable to form a complex compound with the bismuth salt, which protects the bismuth from the reducing action of the sugar. The author, furthermore, finds that iodthion does not interfere with the reaction produced by glucose upon Fehling's solution.—Pharm. Ztg., LVII (1912), No. 15, 148; from Munch. Med. Wschr., 1912, No. 2.

Urine: Source of Error in Trommer's Sugar-Test.—In accordance with the directions for carrying out Trommer's test for sugar in urine, a fairly concentrated solution of sodium hydroxide is added, followed by the careful addition of cupric sulphate, so long as the cupric hydroxide is redissolved, whereupon the liquid is heated until it begins to boil. Professor N. Schulz finds, however, that if the addition of the reagent is reversed, two periods arise which are liable to lead to deception: the first, due to great solvent power of urine on cupric hydroxide, and the second, due to the liability of reduction by normal urine after comparatively short boiling. The author, therefore, warns against a deviation from the order of the original directions, for those who still prefer to operate by Trommer's method, but recommends as preferable the method depending on the use of Fehling's solution, or better yet, Heine's modified solution.—Pharm. Ztg., LVII (1912), No. 15, 148; from Munch. Med. Wschr., 1912, No. 5.

Editorial Notes and Announcements

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The Association does not accept responsibility for the opinions of contributors. Offensive personalities must be avoided.

Under the rules of the Post Office the JOURNAL can be regularly mailed only to bona-fide paid subscribers. Subscriptions and association dues should be sent to the Treasurer, H. M. Whelpley, 2342 Albion Place, St. Louis, Mo.

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N. A. R. D. CONTRIBUTION TO PROCTER FUND.

The N. A. R. D. is the latest contributor to the Procter Memorial Fund, to the extent of $100.00.

This fund is held by the A. Ph. A. as trustee for the creation of a suitable memorial to the memory of William Procter, the Father of American Pharmacy. The exact character which the memorial is to take will depend upon the total amount raised. If it is to be in keeping with the unselfish and unassuming character of Procter, it should be of such a nature as will best advance the cause of professional pharmacy to which he was so bountiful a contributor.

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A. PH. A. PAPERS IN CHEMICAL ABSTRACTS.

It may be of interest to those who are not members of the American Chemical Society to learn that papers published in the JOURNAL are abstracted and published under the division of Pharmaceutical Chemistry in *Chemical Abstracts*, one of the official publications of the A. C. S. The abstracts are prepared by M. I. Wilbert, the very efficient Secretary of the Committee on National Formulary.

SUNRISE FROM PIKE'S PEAK.

(By a Colorado Member of the A. Ph. A.)

The sky is clear and o'er the peak, a snowy
mantle's drawn ,
As in the distant east we see the first gray
streaks of dawn.
Below us cities sleep—'tis night; from us the
night has fled,
And soon o'er eastern skies we see a conflagration spread.
Now brighter, redder grow the skies; the
crimson light climbs higher,
And far above the horizon, a fleecy cloud
takes fire.
At length the colored bands of light, around
a circle play;
And now a golden diadem, they crown the
King of Day.
Oh, scene of splendor—grand! sublime! O'er
earth the sun appears!
Fair nature's face seems wreathed in smiles—
last night 'twas bathed in tears.
From flowery dell to snowclad peak; in great
and small degree,
All nature's parts are made to blend in perfect harmony.
Below us panoramas spread, with vegetation
green;
While on this snow-capped peak, millions of
frosty diamonds gleam.
Oh, thou great orb of heat and light, what
magic in thy power
To quicken now some dormant life; or ope'
the budding flower!
All nature feels thy magic touch; thy powers,
her wants attend:
And all mankind and all that live; for life
on Thee depend!
And e'en these cold and icy snows; when
touched by thy warm light,
Flow o'er the land in crystal streams; or, in
the clouds take flight!
Then who would nature's plan survey, or
broader vision seek;
Ascend this rocky mount and view the sunrise from Pike's Peak. E. G. F.

<>

N. A. R. D. CONVENTION.

The date of the National Convention, August 12-16, being five weeks earlier than ever before makes our fiscal year that much shorter, and as our books close on July 31 for the fiscal or convention year, we hope you will see the importance of selecting your delegates, and also pushing the collection of dues, so that the work of the N. A. R. D. will in no way be handicapped.

The convention this year will be one of the most important in our history, as legislative and other vital matters will come before the convention, and from present indications the convention will be very largely attended by the druggists and their families.

The druggists of Milwaukee are making preparations on an extensive scale to entertain the visitors. The convention hall is large and complete in every detail.

The drug show will be the largest in its history. —*N. A. R. D. Notes.*

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CASPARI FOR CHIEF OF THE BUREAU OF CHEMISTRY.

A large number of those acquainted with the ability and character of Prof. Charles Caspari, Jr., have been urging him strongly for Chief of the Bureau of Chemistry. The President certainly could not make a wiser selection.

Professor Caspari possesses to the full the varied accomplishments which the occupant of that position should have: natural ability, training, experience, patience and diplomacy.

It is needless to say that Professor Caspari has not offered himself as a candidate for the position, and this mention of him is made in direct opposition to his expressed wishes.

The Bulletin Board

NATIONAL ASSOCIATION OF BOARDS OF PHARMACY.

To State Board Members:

GREETING—It is a pleasure to direct your attention to the annual meeting of the National Association of Boards of Pharmacy in the city of Denver, Colorado, on August 19, 20, 21, 22, and 23, 1912. This will be a very important occasion in many respects.

First. This will be a great reunion, for we hope to present an unbroken front, by having our entire family present, in that we will have a representative from every State Board in the Union.

Second. Our anticipations are strong in the belief that our active membership list will show material gains from 32 as at present to 40.

Third. Our associative membership will show the remaining nine states.

Fourth. We have a vital and important resolution to be presented by the National Association of Pharmacologists, looking to the authorization of a National Certificate, which will pass current in all the States. We shall ask for a liberal discussion of this suggestion.

Fifth. The report of the Syllabus Committee will be intensely interesting, for the reason that some of the best talent of our calling are engaged in this work.

Sixth. The report of our Executive Committee, the members of which are all prominent, distinguished and successful business men of our calling, will bristle with entertaining and captivating facts, unfolding an accumulation of useful and valuable data.

Seventh. A special request is urged upon each representative of active Board members, to come prepared to maintain their faith in our organization, relating personal experiences of the advantages of reciprocity and the benefits of membership.

Eighth. A prize is offered for the best paper setting forth the virtues, advantages and great good accomplished by the National Association of Boards of Pharmacy, since its organization and the individual good each Board may derive therefrom.

Ninth. The association, fellowship and friendships established between delegates, resulting from these annual gatherings, are of immeasurable good and of life-long tenure.

Tenth. Interchange of ideas, experiences related, and the solving of the various problems that confront many State Boards, is a valuable asset.

Eleventh. There is absolutely no sane reason why reciprocity should not prevail in every State in the Union. Those entertaining objections will be gladly heard.

Twelfth. I will hazard the opinion that there is no tenable ground, upon which any State can base a refusal, continuing without the pale of influence of this Association. There are no conditions or contentions, that any State can maintain, that justifies their insistent declination, to become active members. If it is your law ,amend it. If it is a professional reason, alter and amend the By-Laws and Constitution of the National Body, so that a more rigid demand shall be made of each active member as to the standard of examinations maintained. If a business one, inject a little charity; this will insure a conversion of the refractory, dissenting State. Let's get right and together.

Thirteenth. Be liberal, be earnest, be sincere, be with us, for you are most cordially and fraternally welcome.

Yours in the faith,

R. H. WALKER, President.

TENTATIVE PROGRAM N. A. B. P.

TUESDAY, AUGUST 20, 1912.

FIRST SESSION.

4:00 P. M.

(1) Address of welcome by the Mayor.
(2) Response by Wm. Mittelbach, Boonville, Mo.
(3) Address of welcome by some druggist of Denver.
(4) Response by L. C. Lewis, Tuskegee, Ala.
(5) Roll call.
(6) Appointment of credentials committee.
(7) Arrangement of program to suit departments.
(8) Announcements.

WEDNESDAY MORNING, AUGUST 21, 1912.

SECOND SESSION.

9:00 A. M.

(1) President's address.
(2) Report Secretary-Treasurer.
(3) Mr. Engstrom's Report to National Association Board of Pharmacy.
(4) Report standing committees.
(5) Appointment of nominating and other committees.

WEDNESDAY AFTERNOON.

THIRD SESSION.

2:00 P. M.

(1) Report condition of Pharmacy by delegates.
(2) Announcements.

WEDNESDAY EVENING.

NIGHT SESSION.

8:00 P. M.

Joint sessions as may be arranged.

THURSDAY MORNING.

FIFTH SESSION.

9:00 A. M.

(1) Unfinished business.
(2) New business.
(3) Election and installation of officers.
(4) Good of Pharmacy in general.
(5) Adjournment.

Any of the above may be altered at the discretion of the President and Secretary, and Executive Committee.

WHY NOT SUMMER MEETINGS?

While casually examining the by-laws of several local branches of the American Pharmaceutical Association, I was much surprised to find that each dispensed with summer meetings, just as does the one to which I belong. Members could not enlighten me as to the cause for this in our branch; whether precedent or because the weather is hot in the summer. Most of them guessed the latter.

To me, neither of these reasons appeal. Pharmacists do not cease to labor, or to plan, or to experiment, or to progress, just because it is warm. Most of them are just as busy in summer as in winter. And how may others learn of their successful experimental work except by the publicity of their meetings, or through the publication of their results in some journal. What few will trouble to write out such matter for publication?

The pharmacy of the summer is more perplexing than that of the winter. Most preparations are harder to preserve in the hot months. Many require changes in their formulas, and others present ever trying problems for elegant dispensing. Special summer month problems are constantly presenting themselves for solution.

Sometimes we hear of these troubles and their remedies at a winter meeting. But the memory has been dulled as to essential and interesting details, and the subject enthuses little because it is of problems of the past. A subject can never be so readily discussed as when bolstered by the enthusiasm of recent observation and successful experimentation. And to a listener, could anything be more interesting than a bridge over one's own immediately perplexing difficulties?

But you, too, may think it is too hot for meetings. Why not have morning or afternoon sessions in the open air? Do not the conventions all meet in the summer, and they do not, usually, have the advantage of open-air meetings? No city, or town, is devoid of some park, or other place, within short ride by train or trolley or automobile where meetings may be held. Seclusion can always be had in the most public of places.

If no private ground is available, and the meetings must be held in a public park, the owner or manager will always use especial effort to make such a meeting pleasant, and will generally outdo himself in courtesy and accommodations. It is a compliment and an advertisement to him, so why shouldn't he do the best in his power? And this is most emphatically true, when luncheon or refreshments are ordered of him.

Many educational excursions may also be made. Manufacturing chemists and pharmacists make professional visitors exceedingly welcome, and a trip each year to a particular laboratory is worthy of the most trying heat, for new processes are constantly being developed, new apparatus and machinery installed, and new products being brought to the public notice.

Trips to farms where drug plants are cultivated constitute most interesting side trips. There are numbers of these near the cities, both under government and private control.

To me the possibilities of these meetings are so great that they can not be measured, and the excuses for not having them so small that they are negligible. If you are an enthusiast, take the matter up in your local branch, and you will find that nearly everybody else has wondered why the meetings have not been held, and will join you in the movement to have them, and to make them a success.

HENRY B. FLOYD.

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INTERSTATE ASSOCIATION OF BOARDS OF PHARMACY.

Members of the State Boards of Pharmacy from Illinois, Indiana, Minnesota, Ohio and Wisconsin met in a regular session of the Interstate Association of Boards of Pharmacy at Columbus, Ohio, June 17th and 18th.

At the invitation of the Ohio Board of Pharmacy the visiting members attended the examination of a large class of pharmacists, which, at the time, was being conducted by the Ohio Board. A banquet was tendered the visiting members at Hotel Chittenden, Monday evening, June 17th.

The Interstate Association of Boards of Pharmacy was organized nearly four years ago, the object being to establish uniform requirements for registration, which would make possible the interchange of certificates between the states represented in the association.

By visiting each other, at times when examinations are held, by the Boards visited, the Boards of the respective states are afforded splendid opportunities to compare notes and to hold conferences where measures toward a gradual advancement of the

standard of examinations may be thoroughly discussed. At the same time the Boards, belonging to this association, are working toward the end when the requirements for a Pharmacist's certificate may be on the same level in all the states.

The Boards of Pharmacy of the following states are members of the Interstate Association, Illinois, Indiana, Kentucky, Michigan, Minnesota, Ohio, Wisconsin, and these Boards will issue certificates of registration, without examination, to applicants who are complying satisfactorily with the requirements for reciprocal registration.

The President of the Interstate Association of Boards of Pharmacy is Mr. Burton Cassaday, of Terre Haute, Ind., member of the Indiana Board of Pharmacy. The Vice President is Mr. Robin H. White, of Mt. Sterling, Ky., member of the Kentucky Board of Pharmacy, and the Secretary-Treasurer, Mr. Otto J. S. Boberg, of Eau Claire, Wis., member of the Wisconsin Board of Pharmacy. OTTO J. S. BOBERG, Secretary.

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U. S. PUBLIC HEALTH AND MARINE HOSPITAL SERVICE.

Recent changes in Pharmacists' assignments, etc.

Board of medical officers convened to meet at the Marine Hospital, Savannah, Ga., at the call of the chairman to examine Pharmacist L. G. Smith, to determine his fitness for promotion to the grade of Pharmacist of the second class. Detail for the board: Passed Assistant Surgeon C. H. Lavinder, chairman; Acting Assistant Surgeon A. B. Cleborne, recorder. June 21, 1912.

Keen, W. H., Pharmacist. Granted 27½ days' leave of absence to begin between July 5 and 15, 1912. June 26, 1912.

Brown, F. L., Pharmacist. Directed to proceed to San Juan, P. R., and report to Passed Assistant Surgeon R. H. Creel for special temporary duty in connection with plague suppressive measures. July 2, 1912.

Spangler, L. C., Pharmacist. Directed to proceed to Delaware Breakwater Quarantine, Lewes, Del., and report to Surgeon W. G. Stimpson for duty in care of detained passengers on the steamer Haverford on account of smallpox. July 8, 1912.

Sterns, C. O., Pharmacist. Granted one day's leave of absence, June 8, 1912, under paragraph 210, Service Regulations. July 2, 1912.

Hepler, G. K., Pharmacist. Granted 24 days' leave of absence from August 5, 1912. July 9, 1912.

Council Business

COUNCIL LETTER NO. 22.

PHILADELPHIA, July 6, 1912.

Members of the Council:

Motion 45 (*Postponement of Publication of the Year Book* (*Report on the Progress of Pharmacy*) *for* 1911 *until after the Denver* (1912) *Meeting*) has received a majority of affirmative votes.

Motion No. 46 (*Election of Members*). You are requested to vote on the following applications for membership:

No. 236. Wm. Fankhauser, M. D., 971 Stibbins Ave., New York, N. Y., rec. by Caswell A. Mayo and Theodore Weicker.

No. 237. Herbert Sharman, Sergeant 1st Class, Hospital Corps, U. S. A., Ft. Sill, Okla., rec. by Wm. B. Day and J. W. England.

No. 238. Michael Ilitz, Hospital Corps, U. S. Army, Fort Mills, Corregidor, P. I., rec. by Wm. B. Day and Clarence C. Young.

No. 239. Henry L. Begley, Sergeant Hospital Corps, U. S. Army, care Chief Surgeon's Office, Manila, P. I., rec. by Wm. B. Day and Charles C. Young.

No. 240. James R. Merryman, Sergeant Hospital Corps, U. S. Army, care Chief Surgeon's Office, Manila, P. I., rec. by Nels Casmussen and Chas. C. Young.

No. 241. William Joseph Murphy, Sergeant Hospital Corps, U. S. Army, 175 Calle Conseption, Manila, P. I., rec. by Wm. B. Day and Chas. C. Young.

No. 242. Adolph Jole, Sergeant Hospital Corps, Fort Mills, Corregidor, P. I., rec. by Wm. B. Day and Chas. C. Young.

No. 243. David Goodman, Sergeant Hospital Corps, U. S. Army, Fort Mills, Corregidor, P. I., rec. by Wm. B. Day and Chas. C. Young.

No. 244. Elmer Jeen, Sergeant Hospital Corps, Fort Mills, Corregidor, P. I., rec. by Wm. B. Day and Chas. C. Young.

No. 245. Joseph Stahl, Sergeant Hospital Corps, U. S. A., Fort Mills, Corregidor, P. I., rec. by Wm. B. Day and Chas. C. Young.

No. 246. Edward John Rihn, 938 5th Ave., Ford City, Pa., rec. by J. A. Koch and A. F. Judd.

No. 247. Peter A. Kuenzig, 4514 Liberty Ave., Pittsburgh, Pa., rec. by J. A. Koch and Fred J. Blumenschein.

No. 248. Alphonse Major, 461 Pearl St., New York, N. Y., rec. by R. G. Eccles, M. D., and John G. Godding.

No. 249. Amos Wilson Clark, Sergeant 1st Class, Hospital Corps, U. S. A., Fort William McKinley, Rizal, P. I., rec. by Francis J. Eisenman and Chas. C. Young.

No. 250. William Arthur Harvey, 26 St. Andrews' Place, Brooklyn, N. Y., rec. by Otto Raubenheimer and Hugh Craig.

No. 251. Edward Joseph McTague, 2601 Jackson St., Seattle, Wash., rec. by Charles W. Johnson and A. H. Dewey.

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No. 253. Joseph Vincent Delgado, Colon, Republic of Panama, C. A., rec. by J. T. McGill and E. A. Ruddiman.

No. 254. John Arthur Riley, 301 Livingston St., Brooklyn, N. Y., rec. by J. H. Beal and J. W. England.

No. 255. Arthur Malcolm Henry, Tallahassee, Florida, rec. by Theo. D. Wetterstroem and J. W. England.

No. 256. Samuel Solomon Kovaco, 201 Broad St., Johnstown, Pa., rec. by J. A. Koch and Fred J. Blumenschein.

No. 257. Cloyde W. Snyder, 5301 Indiana Ave., Chicago, Ill., rec. by Clyde M. Snow and Wm. B. Day. (Awarded for Excellence in Pharmacy, University of Illinois, School of Pharmacy.)

No. 258. George D. Feldner, 3218 Magazine St., New Orleans, La., rec. by F. C. Godbold and C. D. Sauvinet.

No. 259. Emiel Schulz, Sergeant 1st Class, Hospital Corps, Fort Shafter, Honolulu, Hawaii. Territory, rec by H. J. Weber and Wm. B. Day.

No. 260. Christopher Hermann, Sergeant 1st Class, Hospital Corps, Fort Shafter, Honolulu, Hawaii Territory, rec. by H. J. Weber and Wm. B. Day.

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No. 277. Jesse School Tyson, 354 Washington Ave., E. Downingtown, Pa., rec. by G. H. Meeker and Chas. E. Vanderkleed (Prize of Dr. G. H. Meeker, Medico-Chirurgical College, Philadelphia).

No. 278. Thos. Keefe, Clarks, Neb., rec. by Charles R. Sherman and Wm. B. Day.

No. 279. Fred Anderson Miller, 1939 Ashland Ave., Indianapolis, Ind., rec. by Charles R. Eckler and Frank R. Eldred.

No. 280. Otto Alpers, 282 City Island Ave.,

City Island, N. Y., rec. by William C. Alpers and J. H. Beal.

No. 281. Albert E. Lerche, 325 Main St., Springfield, Mass., rec. by C. H. Packard and Theodore J. Bradley.

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No. 283. Ernest Dalton, 212 Exchange St., Chicopee, Mass., rec. by Irving P. Gammon and John G. Godding.

No. 284. Ira Hotchkiss Pierce, Salem, Iowa, rec. by Wm. J. Teeters and R. A. Kuever. (Prize of Prof. W. J. Teeters, University of Iowa, College of Pharmacy).

No. 285. William Osborne, Jr., Danforth, Me., rec. by H. M. Whelpley and J. W. England. (Prize for highest rank in Pharmacy at University of Maine, Department of Pharmacy).

J. W. ENGLAND,
Secretary of the Council.

Changes of Address

All changes of address of members should be sent to the General Secretary promptly.

The Association will not be responsible for non-delivery of the Annual Volume or Year Book, or of the JOURNAL unless notice of change of address is received before shipment or mailing.

Both the old and the new address should be given, thus:

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To Plover, Iowa.

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From Camp McGrath, Batangas, P. I.
To Ft. Wm. McKinley, Rizal, P. I.

CONSTANTINE TROXLER,
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To 4172 E. 94th St., Cleveland, O.

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To 177 Morgan St., St. Louis, Mo.

S. S. KOVACO,
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To Duquesne, Pa.

WILBUR L. SCOVILLE,
From 805 Second Ave., Detroit, Mich.
To 81 Melbourne Ave., Detroit, Mich.

MARTIN E. TITUS,
From 570 Dower Ave., Milwaukee, Wis.
To 235 13th St., Milwaukee, Wis.

G. L. SECORD,
From 2306 Taylor St., Chicago, Ill.
To 4654 Washington Blvd., Chicago, Ill.

OSCAR OLDBERG,
From N. W. University Bldg., Chicago, Ill.
To 7808 Union Ave., Chicago, Ill.

MATT R. NOREEN,
From Ft. Gibbon, Tonona, Alaska.
To Presidio, San Francisco, Cal.

THOMAS M. MCKEHOE,
From 417 Stapleton Bldg., Billings, Mont.
To Box 429, Billings, Mont.

CHESTER A. DUNCAN,
From Baylor University, Dallas, Texas.
To 3416 Junius St., Dallas, Texas.

THOMAS WHITEFIELD,
From 362 Wabash Ave., Chicago, Ill.
To 545 S. Wabash Ave., Chicago, Ill.

GEORGE H. PAUL, Sgt. 1st Class,
From Camp Jossman, Guimaras, P. I.
To Margosatuwig, Mindanao, P. I.

THE SUCCESS OF FAILURE.

"In our superior knowledge we are disposed to speak in a patronizing tone of the follies of the alchemists of old. But their failure to transmute the baser metals into gold resulted in the birth of chemistry. They did not succeed in what they attempted, but they brought into vogue the natural processes of sublimation, filtration, distillation, and crystallization; they invented the alembic, the retort, the sand-bath, the water-bath, and other valuable instruments. To them is due the discovery of antimony, sulphuric ether and phosphorus, the cupellation of gold and silver, the determining of the properties of saltpetre and its use in gunpowder, and the discovery of the distillation of essential oils. This was the success of failure, a wondrous process of Nature for the highest growth,—a mighty lesson of comfort, strength, and encouragement if man would only realize and accept it."—*William George Jordan.*

The American Pharmaceutical Association

Organized: Philadelphia, 1852. Incorporated: Washington, D. C., 1888.

Sixtieth Annual Convention, Denver, Colo., August 19, 1912.

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L. D. HAVENHILL, *Chm*...Term expires 1917
L. F. KEBLER.....Term expires 1918
HARVEY A. SELL.....Term expires 1919
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CHRISTOPHER KOCH.....Philadelphia, Pa.

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(Appointed by the President.)

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BAN ON INDEMNITY INSURANCE.

The insurance commissioner of the State of Missouri has placed a ban upon indemnity insurance for druggists, doctors, dentists and automobilists. It is his contention that such a system of insurance is a danger to the people, as it would tend, if not to encourage carelessness, at least to make many persons less careful in matters in which every precaution should be taken. He says the measure is particularly necessary as affecting automobilists, as owners and drivers are likely to take more chances if they feel that they will be protected from heavy costs by an insurance policy. The order affects many insurance companies in the state which have been doing a large business in indemnity insurance. It is as follows:

Insurance companies are hereby prohibited from writing insurance in the state of Missouri for physicians, surgeons, dentists or druggists idemnifying them against liability for damages resulting from negligence in dispensing or administering drugs and medicines or in the practice of medicine, surgery, dentistry or pharmacy.

Insurance companies are also prohibited from writing insurance in the state of Missouri idemnifying the owners or drivers of automobiles against liability for damage arising from injuries or death occasioned to persons who may be struck by automobiles.

It would seem there is to be no end of restrictive regulation and legislation affecting the druggist, and making his business more hazardous and less profitable. Menaced on every hand by laws and regulations not easily interpreted in all their phases, he is in constant danger of being sued or prosecuted for an unintentional infraction of some regulation in violation of some law. Now the Missouri official would prevent him from protecting himself against financial loss as the result of innocent mistakes or false charges by denying him the right to indemnity insurance. Surely this is the limit. By the same course of reasoning fire insurance is dangerous because it leads to carelessness in the protection of property or tempts to arson; marine insurance is bad because it tempts owners of ships to wreck them at the risk of many lives; life insurance is against public policy because it might tempt to suicide or murder as a means of securing money for the beneficiaries. In a few cases all these kinds of insurance have led to wrongdoing, but on the whole their operation has been helpful to individuals and to the community.

So with indemnity insurance. While it may be abused by a few unprincipled men, its general result is wholesome and salutary, saving many individuals from ruinous financial loss through harassing suits by unprincipled persons.—*Voice of the Retail Druggist.*

"In their hurry to attain some ambition, to gratify the dream of a life, men often throw honor, truth, and generosity to the winds. Politicians dare to stand by and see a city poisoned with foul water until they 'see where they come in' on a water-works appropriation. If it be necessary to poison an army—that, too, is but an incident in the hurry for wealth."—*William George Jordan.*